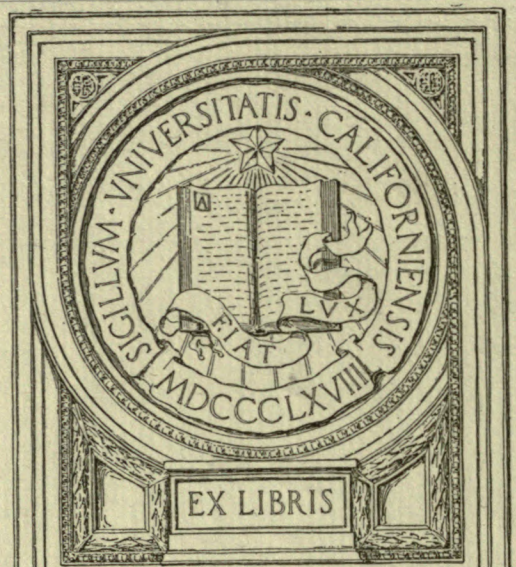


Agric.-Forestry. Main Library

520
F7152
v.13

Pamphlet on periculture.

NO. 49.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

October 1 to 15, 1910.

NEW PLANT IMMIGRANTS.

BELOU MARMELOS. (Rutaceae.) 28875. Plants of bael fruit from Pusa, Bengal, India. Presented by Dr. A. Howard. Dalsing serai variety. (See No. 24450 for description.) For distribution later. (See photograph.)

BROMELIA SP. (Bromeliaceae.) 28889. Seeds from Paraguay. Presented by Mr. C. F. Mead. "This plant, which in Guaranay is called 'Caraguata', is a cactus. It grows in camp hereabouts, especially in barren spots. Every year in fall the center leaves turn bright red and it flowers--a cluster of pink and white flowers, similar to tuberoses. The fruits are in a cluster 10 to 15 inches long and 4 to 6 inches in diameter, bright yellow when ripe, and each fruit is the size of a small plum. It is used here for preserves only. The plant has a bad name, owing to the difficulty of clearing it out of land after it is well started." (Mead.) For distribution later.

CARICA PAPAYA. (Passifloraceae.) 28887. Seeds from Camp Overton, Mindanao, Philippine Islands. Presented by Major Chas. H. Muir, through Mr. E. C. Green. "This seed is from the best variety of this fruit I have ever met with in either the Philippines or Cuba; it is spoken of as the Capitan by some, and as the Java by others." (Muir.) For distribution later.

CATHA EDULIS. (Celastraceae.) 28825. Plants from Aden, Arabia. Procured by Mr. Chas. K. Moser, American Consul. "Mr. Moser reports that nearly every Arab in Western Arabia chews khat habitually, often paying half his daily wage for the fresh leaves. Khat contains an alkaloid which acts as a stimulant and this will be given especial study as to its harmful effects before any general distribution is made." (Fairchild.) (See No. 24714 for further description.) For distribution later.

CYNARA SCOLYMUS. (Compositae.) 28877. Plants of the Precoce d'Alger, Artichoke of Algeria. From Maison-Carree, Algeria. Presented by Dr. L. Trabut. For distribution later.

CYTISUS PROLIFERUS var. palmensis. (Fabaceae.) 28827. Seeds from Porto Ovotava, Teneriffe, Canary Islands. Presented by Mr. Geo. V. Perez. "This is a splendid forage plant and very drought resistant. The failures with it are due to the ignorance of the farmers and to not cutting back the plant. Cattle and horses have to learn to eat it and relish it ever after.

SB391
P3
v.13

Agric.-Forestry. Main Library

In the Island of Palma, Canary Islands, where it has been native from time immemorial, it has been used with the greatest success. It is quite as nutritious as luzerne and does not require irrigation. I know of nothing that will fatten cattle and horses so much." (Perez.) For distribution later.

DIOSPYROS DISCOLOR. (Ebenaceae.) 28900. Seeds from Iloilo, Panay, Philippine Islands. Presented by Mr. J. B. O. Colman, Bureau of Public Works. "This is a species of persimmon which has a thick and pleasantly-flavored meat. The fruits from which these seeds were taken were unusually large and perfect." (Colman.) For distribution later.

ECHIUM SIMPLEX. (Boraginaceae.) 28828. Seeds from Porto Ovotava, Teneriffe, Canary Islands. Presented by Mr. Geo. V. Perez. "The so-called Pride of Teneriffe, a lovely showy native plant, remarkable for its single tall spike of white flowers reaching from 2 to 3 yards high. From what I have seen and observed I have come to the conclusion that, besides being a very ornamental plant, it could be made a most valuable fodder, having the advantage over the prickly comphrey of being drought resistant. The idea is entirely my own after watching how greedily my cows eat it." (Perez.) For distribution later.

GOSSYPIUM SPP. (Malvaceae.) 28879-880. Seeds of two varieties of wild cotton from Mauritius. Presented by Mr. G. Regnard. For distribution later.

LATHYRUS POLYPHYLLUS. (Fabaceae.) 28823. Seeds from Oregon. Presented by Mr. Geo. R. Schoch. "A perennial species with violet colored flowers, abundant in the open coniferous woods throughout Western Washington and Oregon. The plants appear in early spring and become fully mature and dry in July. Stock are not fond of the plants when green, but eat the hay readily." (C. V. Piper.) For distribution later.

PASSIFLORA SP. (Passifloraceae.) 28878. Seeds from Patras, Greece. Grown by Mrs. Crowe. Presented by Mr. A. Donaldson Smith, American Consul, Aguascalientes, Mexico. "I have tasted the passion flower fruit in many places and the fruit from which these seeds were taken was the best." (Smith.) For distribution later.

RAJANIA PLEIONEURA (Dioscoreaceae). 28894. Roots from Dominica, British West Indies. Presented by Mr. J. Jones, Curator, Botanic Station. "The waw-waw is a native of Dominica. It occurs wild in the forests and does best in the deep shade. It is not cultivated in this Island, probably because an abundance of the yam can be obtained by digging in the forest.

40292

The waw-waw is considered by many people to be superior to the yams produced by the Dioscoreas." (Jones.) For distribution later.

SOLANUM MURICATUM. (Solanaceae.) 28899. Cuttings from Grand Canary, Canary Islands. Presented by Mr. M. Moniz, at the request of Mr. Ross J. Hazeltine, American Consul at Teneriffe. "A fruit known here as melon pear. It grows on bushes about two or three feet high; when ripe it is yellow and the shape of a melon. In taste it is a blend between a cantaloupe and a pear." (Solomon Berliner.) This is the pepino of Guatemala. For distribution later. (See photograph.)

TRITICUM DICOCCUM DICOCCOIDES. (Poaceae.) 28885. Seeds of wild wheat from Haifa, Palestine. Presented by Mr. A. Aaronsohn, Director, Jewish Agricultural Experiment Station. "The wild wheat thought by Mr. Aaronsohn to be the prototype of the cultivated wheat." (Fairchild.) (See B. P. I. Bulletin No. 180 for further description.) For distribution later.

VICIA GIGANTEA. (Fabaceae.) 28824. Seeds from Oregon. Presented by Mr. Geo. R. Schoch. "A perennial vetch with ochroleucous flowers, growing along the Pacific Coast from Sitka to middle California. It grows to a great size, the vines being often 8 to 12 feet long and producing a great abundance of plants and pods. The seeds, however, are ordinarily destroyed by insects. Stock ordinarily will not eat the plants while green and are not particularly fond of the hay. The entire plant turns black on drying." (C. V. Piper.) For distribution later.

VIGNA UNGUICULATA. (Fabaceae.) 28829. Seeds of tan cowpea from Togo, Africa. Presented by Mr. G. H. Pape, through Mr. A. B. Conner. For distribution later.

VIGNA UNGUICULATA. (Fabaceae.) 28888-893. Seeds from the province of Para, near the town of Braganca, Brazil. Presented by Mr. W. Fischer. For distribution later.

VITIS SP. (Vitaceae.) 28876. Cuttings from Hollywood, California. Presented by Mr. E. D. Sturtevant. "Native of the southern part of the State of Vera Cruz, Mexico. Said to bear beautiful scarlet flowers. It is hardy here, but does not bloom. It might succeed in southern Florida." (Sturtevant.) For distribution later.

NOTES OF FOREIGN CORRESPONDENTS.

AUSTRALIA, Queensland. Dr. Alexander Graham Bell reports on several plants observed in Queensland, among them the following: Near Kuranda a very tempting fruit, known as the finger cherry, is found. It is red, like a cherry, and is about the shape and size of a finger. It is said to be poisonous and occasionally to cause blindness in those who eat it. However, Mr. Wriede, the station master at Kuranda, says that he used to eat it freely without ill effects, and that the children are quite fond of it.

In the scrub near Kuranda we noticed trees bearing pods about the size and shape of a banana, but at least twice the diameter. Upon opening the pods they were found to contain huge beans that look very much like chestnuts. They have a leathery skin and the interior is white and not very hard, about the consistency of a nut. I tasted one of the beans, although I was told it was poisonous. It tasted very much like a nut but had no distinctive flavor. In spite of the poisonous nature of the bean the "black fellows" have learned to use it as food. They first roast the beans in hot ashes, then skin them and pound the white flesh into coarse flour. They fill a basket with this flour and place it in running water all night. In this way the poisonous principle is washed out.

The prickly pear in Australia has become such a nuisance that enormous sums are paid to get rid of it. Land is practically given away to persons who will undertake to clear it of prickly pear. Mr. Jones suggests that instead of spending money in the useless task of attempting to eradicate it, the Australians should make it of use and make a profit out of it. He has considered the question of manufacturing paper from it but the outlook is not encouraging. It has too much juice and not enough fiber. He thinks alcohol could be made from it, as it contains about 5 per cent reducing sugar. At all events he says a fortune awaits the man who can find a use for it.

FORMOSA, Taihoku. Mr. Takiya Kawakami, Sept. 8. Writes that he will send, by the end of the present year, the three varieties of sugar cane cultivated at the Formosa Sugar Experimental Station. Chinese names, Chiku-cha, An-cha and Ra-cha.

TRANSVAAL, Pretoria. Prof. J. Burtt-Davy, Sept. 6. Writes in regard to Acacia robusta (S.P.I. No. 28550), that it is a characteristic tree of the dry bush veld below 4,500 feet altitude, i.e., in the subtropical zone of the Transvaal. The wood is sometimes used for fence posts when the rarer and harder sorts, such as Olea verrucosa, are not available.

BELOU MARMELOS, BAEL FRUIT

A handsome ornamental tree, leafless one month only, with shining dark green leaves. The orange-like fruit is eaten by the natives but is unpalatable to whites except as a sherbet or a marmalade. The fruit is anti-dysenteric. The tree is common throughout India, is easily cultivated and stands a wide range of temperature, 20° to 120° F.

BELOU MARMELOS, BAEL FRUIT

A handsome ornamental tree, leafless one month only, with shining dark green leaves. The orange-like fruit is eaten by the natives but is unpalatable to whites except as a sherbet or a marmelade. The fruit is anti-dysenteric. The tree is common throughout India, is easily cultivated and stands a wide range of temperature, 200 to 1200 F.

SOLANUM MURICATUM.

Fruits of the pepino, a perfectly seedless fruit with a decided taste of cucumber but sweet and melting, and appreciated by a great many people. It has been grown occasionally in South Carolina.

NO. 59.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

March 1 to 15, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.)

AMYGDALUS PERSICA. (Amygdalaceae.) 29991. Seeds of a peach from Tsinanfu, Shantung, China. Presented by Dr. J. B. Neal. "This peach is grown not far from here. It is a cling and though rather inconvenient for eating, is very large and luscious, COMING INTO MARKET ABOUT THE MIDDLE OF SEPTEMBER AND LASTING FOR A MONTH OR MORE. It is the last peach we get during the season, the peach supply beginning the middle or last of June and continuing through the summer and early autumn, about four months in all." (Neal.) For distribution later.

ASPARAGUS SPP. (Convallariaceae.) 29981-983. Asparagus seed from Erfurt, Germany. Purchased from Messrs. Haage und Schmidt. 29992. Seed of Asparagus acutifolius from Jerusalem, Palestine. Presented by Mr. E. F. Beaumont, American Colony, Jerusalem. 30010-011. Asparagus seed from Naples, Italy. Purchased from Dammann and Company. 30012-015. Asparagus seed from Edinburgh, Scotland. Presented by Prof. Isaac Bailey Balfour, Royal Botanic Garden. All these varieties were secured for the Office of Truck-Crop Diseases in breeding a resistant asparagus. All for distribution later.

BERBERIS SPP. (Berberidaceae.) 29957-959. Seeds of barberries from Kew, England. Presented by Dr. David Prain, Director, Royal Botanic Gardens. 29957. Berberis acuminata. 29958. Berberis parvifolia. 29959. Berberis wilsonae. 29999. Plants of barberry from Ussy, France. Purchased from M. Pierre Sebire. Berberis stenophylla corallina. All for distribution later.

COTONEASTER SPP. (Pomaceae.) 29963-971. Seeds of nine species of cotoneaster from Kew, England. Presented by Dr. David Prain, Director, Royal Botanic Gardens. The cotoneasters are especially beautiful for covering walls and for training against the house. For distribution later.

NO. 59.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

March 1 to 15, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.)

AMYGDALUS PERSICA. (Amygdalaceae.) 29991. Seeds of a peach from Teinanfu, Shantung, China. Presented by Dr. J. E. Neal. "This peach is grown not far from here. It is a cling and though rather inconvenient for eating, is very large and luscious, COMING INTO MARKET ABOUT THE MIDDLE OF SEPTEMBER AND LASTING FOR A MONTH OR MORE. It is the last peach we get during the season, the peach supply beginning the middle or last of June and continuing through the summer and early autumn, about four months in all." (Neal.) For distribution later.

ASPARAGUS SPP. (Convallariaceae.) 29981-983. Asparagus seed from Erfurt, Germany. Purchased from Haage und Schmidt. 29992. Seed of Asparagus multifolius from Jerusalem, Palestine. Presented by Mr. E. E. Beaumont, American Colony, Jerusalem. 30010-012. Asparagus seed from Naples, Italy. Purchased from Dammann and Company. 30012-018. Asparagus seed from Edinburgh, Scotland. Presented by Prof. Isaac Bailey Balfour, Royal Botanic Garden. All these varieties were secured for the Office of Truck-Crop Diseases in breeding a resistant asparagus. All for distribution later.

BERBERIS SPP. (Berberidaceae.) 29987-989. Seeds of barberries from Kew, England. Presented by Dr. David Prain, Director, Royal Botanic Gardens. 29997. Berberis aquminata. 29998. Berberis parvifolia. 29999. Berberis wilsonae. 29999. Plants of barberry from Usay, Nranoe. Purchased from M. Pierre Sabire. Berberis stenophylla corallina. All for distribution later.

COTONEASTER SPP. (Pomaceae.) 29963-971. Seeds of nine species of cotoneaster from Kew, England. Presented by Dr. David Prain, Director, Royal Botanic Gardens. The cotoneasters are especially beautiful for covering walls and for treating against the House. For distribution later.

CYDONIA SP. (Pomaceae.) 30059. Cuttings of a quince from Kashgar, Chinese Turkestan. "The quince called in Turkestan 'Beeha'. A large variety with ribbed fruits, covered with heavy down, a prolific bearer. The fruits stewed with sugar, made into a compote or cooked with rice are favorite foods in both Russian and Chinese Turkestan. The plants stand considerable alkali and drouth and are recommendable as a fruit tree for the home garden in desert regions." (Meyer's introduction.) For distribution later. This shipment of cuttings, containing besides this quince, cuttings of elm, grape, willow, poplar and tamarisk, is, so far as can be found, the first importation of cuttings from Chinese Turkestan to the United States. The material, which was shipped January 18 from Kashgar through the American Consul-General in St. Petersburg reached Washington in perfect shape March 9, after exactly 50 days. Much of the material however had been collected as early as the latter part of November.

DIOSPYROS KAKI. (Diospyraceae.) 30065-066. Cuttings of persimmons from Okitsu, Japan. Presented by Mr. T. Tanakawa, in charge of the Government Horticultural Experiment Station. 30065. Fugi. Astringent variety. 30066. Fuyu. Non-astringent variety. For distribution later.

HELIANTHUS SP. (Asteraceae.) 29984. Seeds of a sunflower from Mexico. Presented by Dr. Edward Palmer, Durango, Mexico, through Dr. R. H. True. "Dr. Palmer in 1896 found a rather good-looking sunflower seed in Mexico which has interested me considerably. It is not a large seed but has a good plump kernel and I think will give a fairly good oil yield. The shuck is much thinner than that of the Russian sort and if it will yield in this country might prove valuable. Doctor Palmer tells me that in Mexico where this sort is grown the black shells yield a purplish dye which is esteemed by some. Five years after collection these seeds gave a germination test of 85%." (True.) For distribution later.

JUNIPERUS CEDRUS. (Pinaceae.) 30092. Seeds of a juniper from the Island of Palma. Presented by Dr. George V. Perez, Puerto Orotava, Teneriffe, through Mr. S. T. Dana, Acting Chief of Silvics, Forest Service. "A very rare and nearly extinct tree. It comes from the heights of the neighboring Island of Palma, where the few specimens that remain are being destroyed without mercy. I am afraid the seed is very bad, most of it being barren, probably coming from isolated female trees, but I hope amongst it there may be some fertile seed. In years to come I hope to have some seed myself from a few young trees in my garden here." (Perez.) For distribution later.

LALLEMANTIA IBERICA. (Menthaceae.) 29932. Seed from Kew, England. Presented by Dr. David Prain, Director, Royal Botanical Gardens. This plant which is now being cultivated in Southern Russia for its oil-producing seed, is introduced in order to test its value as an oil-crop, the oil being considered one of the highest grade drying oils. As it occurs native in the drier parts of Palestine, it may be of great importance in the semi-arid portions of the Southwest. For distribution later.

LATHYRUS SPP. (Fabaceae.) 29933-945. Seeds of thirteen species of Lathyrus fom Kew, England. Presented by Dr. David Prain, Director, Royal Botanic Gardens. Introduced for the work of the Office of Forage Crop Investigations. For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 30085-089. Cuttings of mango from Lucknow, United Provinces, India. Presented by Mr. H. J. Davies, Superintendent, Government Horticultural Gardens, at the request of Rev. N. L. Rockey, Gonda, United Provinces. 30085. Amin. 30086. Bombay. 30087. Dilpasand. 30088. Langra. 30089. Safeda. All for distribution later.

MEDICAGO CANCELLATA. (Fabaceae.) 30061. Seed collected near Sarepta, Russia, on top of the Jergeni hills, on white stony, sandy soil effervescing with acid, by Mr. W. Grekow, Zarizyn, Saratoff, Russia. Presented by Mr. W. V. Arapow, Samara, Russia. For distribution later.

MEDICAGO FALCATA. (Fabaceae.) Seed from Svälof, Sweden. Presented by Dr. N. H. Nilsson, Director, Swedish Seed-breeding Association. "This is seed from our real Medicago falcata which grows wild in most parts of our country and it is a very good species. Its harvest-value is not very great, as it is frequently lying down, but as a pasture plant it is the more valuable. It turns vast dry stretches of sandy (but calcareous) ground into excellent pasture fields, where an astonishingly great number of cattle can feed the whole summer. The seed should be prepared in order to make it germinate." (Nilsson.) For distribution later.

MEDICAGO FALCATA. (Fabaceae.) 30009. Seed from Simla, India. Purchased from Mr. F. Booth Tucker, The Salvation Army, Simla. From Kashmir. For distribution later.

PRUNUS SP. (Amygdalaceae.) 29921. Seeds of a cherry from Tokyo, Japan. Presented by Dr. T. Watase, the Tokyo Plant, Seed and Implement Company. "Oshima Sakura. The fastest growing variety of cherry trees, the wood of which is valued for fuel and charcoal." In Japan where the charcoal fire is a great

feature of the home life, prizes are given by horticultural societies for the most beautifully burning charcoal. (Fairchild.) For distribution later.

POPULUS SPP. (Salicaceae.) 30054-057. Cuttings of poplars from Chinese Turkestan. These varieties include one or two very resistant to drought and alkali, one recommended as a sandbinder, and are all recommended as quick growing shade trees for the drier regions of the United States. (Meyer's introductions.) For distribution later.

PYRUS SP. (Malaceae.) 29972-975. Seeds of pears from Kew, England. Presented by Dr. David Prain, Director, Royal Botanical Gardens. 29972. Pyrus balansae. 29973. Pyrus canescens. 29974. Pyrus longipes. 29975. Pyrus adenophorus. All for distribution later.

PYRUS SPP. (Malaceae.) 29994-995. Cuttings of pears from Haifa, Palestine. Presented by Mr. A. Aaronsohn, Jewish agricultural experiment station. 29994. Pyrus syriaca. 29995. Pyrus sp. For distribution later.

PYRUS SPP. (Malaceae.) 30030-30033. Cuttings and seeds of pears from Algeria. Presented by Dr. L. Trabut, Algiers. Cuttings of 30030. "A large fruited Pyrus sp." Cuttings of 30031. "This is near to P. longipes, but sufficiently characterized by the form of the leaves and the fruit. This pear grows on the tufas in the region of Lamoriciere, Daya. I called it gharbensis from the name of the region which formed part of the ancient kingdom of Gharb (of the west) at the time of Arab domination." Cuttings of 30032. "A Pyrus which I have not yet distinguished, and which occurs in the basins of the high plateaux on the edge of the great Chott, a location more calcareous and even alkaline. (This Pyrus has been provisionally assigned to P. gharbensis but it is not identical.)" Seeds of 30033. "Pear occurring on the calcareous tuffs in the dry region south of Oran. Stock good for very calcareous soils." This seed was received under the name Pyrus gharbensis. All notes by Dr. Trabut. For distribution later.

RUBUS SPP. (Rosaceae.) Seeds of three species of Rubus from Kew, England. Presented by Dr. David Prain, Director, Royal Botanical Gardens. 29976. Rubus flosculosus. From the province of Hupeh, Chinese Empire. 29977. Rubus lasiostylus. From the Patung district, Hupeh province. 29978. Rubus parvifolius. From the provinces of Chihli, Shingking and Szechuan, and in Corea and Japan. All for distribution later.

SALIX SPP. (Salicaceae.) 30051-053, 30058. Cuttings of willows from Chinese Turkestan. Among these are forms standing

great alkalinity and high degrees of heat and drought. One is characterized by having brilliant green twigs. (Meyer's introductions). For distribution later.

STRYCHNOS QUAQUA. (Loganiaceae.) 30026. Seeds from Amani, German East Africa. Presented by the Director, Biologisch Landwirtschaftliche Institute. Introduced for the work of this Office in bringing together all the members of this genus with edible fruits, in the hope of finding some worthy additions to the list of semi-tropical fruits standing shipment well. One edible species, S. spinosa, has fruits as large as a small pomelo with a shell that requires a hammer to crack it. (Fairchild.) For distribution later.

TAMARIX SPP. (Tamaricaceae.) 30049-050. Cuttings of two species of tamarisk from Chinese Turkestan. One recommended as a sandbinder often forming mounds twenty meters high, the other as an ornamental shrub for alkali regions. (Meyer's introductions.) For distribution later.

TRIFOLIUM SPP. (Fabaceae.) 29950-956. Seeds of seven species of clover from Kew, England. Presented by Dr. David Prain, Director, Royal Botanical Gardens. Introduced for the work of the Office of Forage Crop Investigations. For distribution later.

ULMUS SP. (Urticaceae.) 30060. Cuttings of elm from Khanaka, Oasis of Sandju, Chinese Turkestan. "A variety of elm called 'Karayagatch', having graceful, slightly drooping branches. Found in an old graveyard." (Meyer's introduction.) For distribution later.

VACCINIUM VITIS-IDAEA. (Vacciniaceae.) 30064. Seed of cowberry from Bremen, Germany. Presented by Dr. G. Bitter, Botanical Garden. Imported for the work of Mr. F. V. Coville in breeding improved blueberries and other Vacciniums. For distribution later.

VITIS VINIFERA. (Vitaceae.) 30042-048. Cuttings of table grapes from Chinese Turkestan. All these varieties are grown under irrigation on arbors and with long wood. They are buried during winter to avoid the great fluctuations of temperature occurring during that season. (Meyer's introductions). For distribution later.

ZEA MAYS. (Poaceae.) 30035-038. Corn from Yachow, Szechuan, China. Presented by Mr. E. T. Shields. Four forms, white, yellow, and smooth and rough-surfaced pop-corn. For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

BRITISH EAST AFRICA PROTECTORATE, Nairobi. Mr. J. W. T. McClellan writes February 15 that he has sent to the Kenya Forest to try to get Landolphia rubber plants or seed for us.

CHINA, Shanghai. Mr. D. MacGregor, Superintendent of Parks, writes without date that "the white bark of the Diospyros lotus is believed to be due to climatic conditions and age. Four-year-old seedlings which I possess, show no signs of the white bark. Further, they can hardly, except by slightly slower growth, be distinguished from plants raised from seeds of the cultivated varieties. With regard to the climatic effect in the production of white bark I have no experience with the Diospyros, but Pinus Bungeana, the white pine of Northern China, occurs here in gardens, some in the native city being of considerable age, but none show the white bark. Some time ago I received a basket of seedling nanmu trees from Mr. Beaman. They were in such delicate condition when they came to hand that I planted them immediately. I am glad to say that the majority of them are alive. Being only plants from 4 to 6 inches high and having sustained a long journey you can understand they were totally unfit to forward to you. By next autumn they ought to be able to stand exporting."

CUBA, Cienfuegos. Mr. Robert M. Gray of the Harvard Botanical Experiment Station writes March 8 that he will try within a few days to send samples of the three varieties of Dasheen (Colocasia antiquorum var. esculentum) grown there, in which he is unable to distinguish any specific difference when grown in good soil. He will also send specimens of the type grown everywhere there as a table vegetable and called locally malanga ysleño (to all appearances Colocasia antiquorum esculentum type).

ENGLAND, Cheshire, Neston. Mr. A. K. Bulley writes March 5 that "Forrest arrived here safely yesterday bringing with him truly terrific loot. My soul quails before the immense quantity of species he has collected. They will take some raising!" He has brought with him seed of the Chinese paper tree and of one of the Chinese labiate oil plants, which seed will be sent us as soon as possible.

INDIA, Saharanpur. Mr. R. S. Woglum writes from Hong-kong that on his return to Saharanpur in April he will secure budwood of the "Sylhet lime" which he thinks would be a very valuable introduction.

NEW ZEALAND, Auckland. Mr. W. Petrie writes January 22 that he will be glad to send us seed of Entelea arborescens as

NOTES FROM FOREIGN CORRESPONDENTS.

soon as it ripens. "It grows in such plenty in my garden that the seedlings are a perfect nuisance, so I do not anticipate that you will have any difficulty in growing them." This introduction is a tree already tried in California and found to be a very rapid grower. It is made for the purpose of ascertaining the possibility of using the sawdust of the wood, which is very soft and light, as packing for grapes in place of the cork and redwood sawdust commonly used.

PARAGUAY, Horqueta. Mr. T. R. Gwynn writes January 17 that as we failed to receive the seeds and specimens of "timbo" (Pithecolobium sp.?), the "urunday" (Astronium sp.?), the "cudpiy" (Piptadenia sp.?), and the "cedro" (Cedrela sp.?), he will get them for us as soon as he can. The "cedro" he describes as having "a leaf exactly like our black walnut, but the wood is soft, grain smooth and even, color of wood exactly that of our cedar, is not an evergreen, is excellent for posts, and grows from posts planted in the ground." He will also send shortly roots of the "guavadamy", and has been promised seed, leaves and twigs of the "ymangasy" or Paraguay rubber tree. In all has spent "something like $500 Paraguay paper money, which is now at a discount of 1300 per cent and has been down to 1800 per cent, so you see I haven't spent much."

PARAGUAY, Villa Encarnacion. Mr. C. F. Mead writes Feb. 1 that as soon as he can obtain them, he will send seeds of the Yerba carmi or yellow yerba. This grows as a shrub, is a finer flavored yerba but not as profitable. However, it flourishes in very poor soil. "As regards the cactus caraguata, (Bromelia argentina, S.P.I. 28689), of which I sent seeds some time ago, giving the plant a bad name on account of its spreading habit, it seems that the fibers of the leaves are used for making rope, the same as henequen and the like plants cultivated in Mexico. While putting up Caraguata bridge, I tested a rough rope of ¾ inch made of caraguata and it stood a greater strain than a new ¾ inch manilla rope(German make), lifting in succession a steel girder of 560 kilos and then a steel trestle of 870 kilos. The ¾ inch manilla lifted the girder but broke on the trestle. The caraguata rope was a rough affair, just twisted together by one of my peons, but most of the fibers were about 30 inches long."

RUBUS SP. CHINESE RASPBERRY.

In connection with Plant Introductions Nos. 29976-978 in this Bulletin we give the above photograph of a new and interesting strain of Chinese raspberry, Plant Introduction No. 23346, which was fruited out last season in California. Unlike introductions many years ago from India, which were disseminated widely through the country under the name of strawberry-raspberry, this strain has berries of a very pleasant flavor suited for preserving. Its greatest probable value, however, lies in its early ripening. At Chico, California, fruits were ripe while the standard varieties were just in bloom. Similar results were obtained in Maryland with this variety. The fruits have no bloom, are unusually large, and are very attractive. From photograph by Dr. Walter Van Fleet, Chico, California, April 14, 1910.

RUBUS SP. CHINESE RASPBERRY.

In connection with Plant Introductions Nos. 29976-978 in this Bulletin we give the above photograph of a new and interesting strain of Chinese raspberry, Plant Introduction No. 23546, which was fruited out last season in California. Unlike introductions many years ago from India, which were disseminated widely through the country under the name of straw-berry-raspberry, this strain has berries of a very pleasant flavor suited for preserving. Its greatest probable value, however, lies in its early ripening. At Chico, California, fruits were ripe while the standard varieties were just in bloom. Similar results were obtained in Maryland with this variety. The fruits have no bloom, are unusually large, and are very attractive. From photograph by Dr. Walter Van Fleet, Chico, California, April 14, 1910.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 64.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

June 16 to June 30, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake, so far as possible, to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

ASPARAGUS SPP. (Convallariaceae.) 31296-297. Fruits of two species of asparagus from the Thian Shan Mountains, Chinese Turkestan. One of climbing habit, the other slightly twining, and found on a sandy alkaline spot. Both of possible value as ornamental perennials and as factors in breeding resistant strains. (Meyer's introductions.) For distribution later.

BERBERIS SPP. (Berberidaceae.) 31287-289. Seeds of three species of barberry from the Tekes Valley, Thian Shan Mountains, Chinese Turkestan. All tall species growing to a height of ten to twelve feet, one of the species seeming to do well in more or less sterile soils. The colors of the berries are respectively red, brown and blue. (Meyer's introductions.) For distribution later.

CALLIGONUM SP. (Polygonaceae.) 31293. Seeds from near Schul-Kuduk, Chinese Turkestan. "A graceful looking, small desert shrub, having a multitude of slightly bent, very white branches, which are from two to four feet in length. Occurs in deserts of moving sands, where it builds small mounds. To be tested for its sand-binding capacities in the dry and not-too-cold sections of the United States." (Meyer's introduction.) For distribution later.

U.S. DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 64.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

June 16 to June 30, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake, so far as possible, to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

ABRAHAMS SPP. (Convallariaceae.) 31289-289. Fruits of two species of asparagus from the Tibian Shan Mountains, Chinese Turkestan. One of climbing habit, the other sprawling, and found on a sandy alkaline spot. Both of possible value as ornamental perennials and as factors in breeding resistant strains. (Hoyer's introductions.) For distribution later.

BERBERIS SPP. (Berberidaceae.) 31287-289. Seeds of three species of barberry from the Tekes Valley, Tibian Shan Mountains, Chinese Turkestan. All tall growing to a height of ten to twelve feet, one of the species seeming to do well in more or less alkalic soils. The colors of the berries are respectively red, brown and blue. (Meyer's introductions.) For distribution later.

CAMELOCLUM SP. (Polygonaceae.) 31295. Seeds from near Sehui-Kuku, Chinese Turkestan. "A striking looking, small desert shrub, having a multitude of slightly bent, very white branches, which are from two to four feet in length. Occurs in deserts of moving sands, where it builds small mounds. To be tested for its sand-binding capacities in the dry and hot-to-cold sections of the United States." (Meyer's introduction.) For distribution later.

CITRUS SPP. (Rutaceae.) 31356-358. Cuttings of three species of citrus from Taihoku, Formosa. Presented by Mr. G. Takata, chief of the Bureau of Industry, Formosan Government. The three species are called respectively, "Ponkan", "Sekkan", and "Tankan", and are reported to be of the finest Formosan varieties. For distribution later.

COLOCASIA SPP. (Araceae.) 31318-320. Tubers of dasheens from Tientai, China. Presented by Mrs. A. O. Loosley, China Inland Mission. 31318. "The tubers of this variety, when cooked, are dry and mealy, and are rather whiter than the Yii-na variety. The leafstalk is referred to by the Chinese as 'white'. (Loosley.) "The tubers are nonacrid when raw. The flesh and sprouts are white. When cooked, the flesh is of fair flavor." (R. A. Young.) 31319. "The tubers of this variety, when cooked, are white at the heart and a purplish color outside. They are sticky and moist. The leafstalk is called Yii-na(black). This variety must be grown deep in soil(not water), and the earth should be kept banked up. In dry weather they should be watered." (Loosley.) "The tubers are nonacrid when raw. The flesh and sprouts are white. When cooked, the tubers are lacking in flavor." (R. A. Young.) 31320. "Tuber pink sprouted." (R. A. Young.) All for distribution later.

COTONEASTER SPP. (Pomaceae.) 31285-286. Seeds from the valleys of the Tekes and the Chong Djighilan, Thian Shan Mountains, Chinese Turkestan, altitudes 3700-4000 feet. Shrubs with large numbers of blackish-red berries, persisting until March. Of possible value as park or garden shrubs. (Meyer's introductions.) For distribution later.

CUCUMIS MELO. (Cucurbitaceae.) 31298-302. Seeds of three winter melons and two summer melons from Maral-Bashi and Kashgar, Chinese Turkestan. "To be tested in sections of the United States where the summers are hot and long, the air dry, and where the soil is of a friable, slightly sandy nature, and contains a fair percentage of alkali." (Meyer's introductions.) For distribution later.

DYERA COSTULATA. (Apocynaceae.) 31362. Seeds from Lawang, Java. Presented by Mr. M. Buysman, Botanic Garden, Lawang. "A Sumatra tree, which produces a surrogate for caoutchouc. A company for the manufacture of articles of this gum is to be formed at Sourabaia with a capital of several millions of florins." (Buysman.) For distribution later.

ELEPHANTORRHIZA ELEPHANTINA. (Mimosaceae.) 31309. Seeds from Springbok Flats, Waterberg District, South Africa.

Presented by Prof. J. Burtt Davy, Government agrostologist and botanist, Pretoria, Natal. "All grazing animals, wild and domestic, are exceedingly fond of this plant. It has long, succulent roots and an underground stem. It does not shoot until rather late in our summer, seldom before December, and its stems are killed again by the first frosts of May. The seed-pods are still green when the frost comes, and the seeds not ripe, but they are so well protected by the strong leatherlike pod that the frost cannot hurt them, and they ripen in the pod long after the stem that bore them has been killed by the frost. The roots are used for tanning leather." (Mrs. Barber, in Harvey, Flora Capensis, vol. 2, p. 277.) For distribution later.

EUGENIA SP. (Myrtaceae.) 31366. Seeds from Paraguay. Presented by Mr. C. F. Mead, Villa Encarnacion. "This is called in Guarany, ñangapiri. Fruit found in forests of Paraguay. In size and color same as May Duke cherry. Tree grows to the height and in the same shape as this cherry. It has, however, from one to three seeds in each fruit and has a button at the bottom similar to the quince. It is a beautiful looking fruit, but the taste is nothing wonderful according to my palate. The tree is found only inside the forest in shade, so it cannot be very resistant to frost." (Mead.) For distribution later.

EUONYMUS SP. (Celastraceae.) 31276. Cuttings from the mountains near Ta-si-ku, Ili Valley, Chinese Turkestan. "A small creeping Euonymus found on grassy mountain slopes with northern exposure, and between shrubs on somewhat moist and cool places; making stems three to four feet in length when growing in well protected places. Leaves small, wine-red underneath and semi-persistent. Of possible value as a ground-cover beneath trees in northern regions. May be expected to be hardier than the ordinary E. radicans and its varieties as the climate of Ili Valley is decidedly of a severe continental nature. On November 24, 1910, the mercury dropped to -30° C.(-22° F.)" (Meyer's introduction.) For distribution later.

HALIMODENDRON HALODENDRON. (Fabaceae.) 31290. Seeds from near Ure-dalik, Chinese Turkestan. "A spiny Colutea-like shrub, found on sandy and alkaline places in deserts where the moisture is not far from the surface. Stands some shade also; fit for a hedge plant in regions where long, hot and dry summers prevail and where the winters are cold." (Meyer's introduction.) For distribution later.

INOCARPUS EDULIS. (Fabaceae.) 31274. Seeds of "Tahiti chestnuts" from Tahiti, Society Islands. Procured by

Mr. North Winship, American Consul. "These Tahiti chestnuts come from what is considered the best tree on this island. The nut just as it is should be planted about four or five inches in the ground, good loamy soil preferred, and also in the place where the tree is desired. It is of slow growth, but makes a beautiful tree, growing to great size and yielding abundantly. Keep the seed and the young plant damp, but not wet." (Winship.) "The seeds are much prized by the natives as food, being eaten boiled or roasted. They are said to be less palatable than the chestnut." (Fairchild.)

MALUS SP. (Malaceae.) 31279-280. Seeds of wild apples from Chong Djighilan and Kuldja, Chinese Turkestan. "Apparently of great value as factors in hybridization work." For further information on the wild apples of this region see the notes from Meyer's correspondence in Bulletin No. 62, this series. (Meyer's introductions.) For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 31379-380. Plants of two varieties of mango from Tahiti, Society Islands. Procured by Mr. North Winship, American Consul. 31379. "Superba. This gives a fine large fruit, heavy and almost round; its color is yellowish golden." 31380. "Altissima. This is practically the same as the preceding, possibly longer and more pointed at the bottom. Its color is pink or red with sometimes a violet hue." "Both of these are less fibrous than the other mangos found here, and are very luscious. These trees begin to bear with the commencement of the rainy season. It is thought that both these varieties came originally from India." (All notes by Mr. Winship.) For distribution later.

MANGIFERA MACROCARPA. (Anacardiaceae.) 31354. Cuttings from Buitenzorg, Java. Presented by the Director, Department of Agriculture. Introduced for the work of this office in testing new and hardier stocks for the mango. For distribution later.

MAURITIA FLEXUOSA. (Phoenicaceae.) 31311. Seeds of the Miriti or ita palm from Brazil. Presented by Mr. Walter Fisher, Acting Director, Campo de Cultura Experimental Paraense. "It is a magnificent palm, its cylindrical stems rising like Grecian columns to a height of 100 to 150 feet, terminated by a crown of large fan-shaped leaves, from the base of which is produced a big bunch of pendulous fruits, some measuring eight to ten feet in length, weighing two to three hundred pounds and containing several bushels of fruit. Each fruit is about the size of a small apple, having a reticulated, polished, smooth shell." (Smith, Dictionary of Popular Names of Plants.) "These palms are a very conspicuous

feature along the Mojú River whence I brought the seeds. I understand that the seeds were once, that is, before the days of rubber, quite largely exported for making buttons. This is one of the so-called ivory nuts." (Fischer.) For distribution later.

MECONOPSIS SPP. (Papaveraceae.) 31269-271. Seeds of three species from Liverpool, England. Presented by the firm of Bees Limited. 31269. Meconopsis integrifolia. This magnificent biennial from the high Alps of western China at altitudes of 11000 to 15000 feet has proven thoroughly hardy in England and Ireland and flourishes and flowers without any special treatment. It is described as very striking, having numerous yellow flowers(as many as eighteen on a three foot plant)usually five to six, but sometimes as much as ten inches in diameter. 31270. Meconopsis delavayi. 31271. Meconopsis rudis. These last two are less known species from similar Alpine locations, with almost equally striking flowers, but probably less easy of culture. All three introduced in the hope of adding hardy biennials of easy culture to our garden flora. For distribution later.

MEDICAGO FALCATA. (Fabaceae.) 31303-304. Seeds of alfalfa from Chong Djighilan and Ili Valleys, Chinese Turkestan. Wild yellow-flowering forms considered by the natives superior to the cultivated varieties. (Meyer's introductions.) For distribution later.

MEDICAGO PLATYCARPOS. (Fabaceae.) 31305. Seeds of alfalfa from near Kurre, Thian Shan Mountains, Chinese Turkestan. "A wild alfalfa of erect growth, bearing yellow flowers and short, flat pods. Found on clayey and peaty hillslopes at altitudes between 6000 and 7000 feet. Stands great cold in winter and drought in summer, and is eagerly eaten by horses, cattle and sheep. Of probable value as a forage plant in sections of the United States where the ordinary alfalfa is winter-killed." (Meyer's introduction.) For distribution later.

PERSEA AMERICANA. (Lauraceae.) 31361. Seeds of avocado from Chile. Received through Mr. José D. Husbands, Limavida, Chile. "There are two and perhaps three classes in this lot, having green and black purple skins like some eggplants. They are very highly esteemed and very dear, costing $6.00 per dozen Chile money or $3.00 gold, and finding a ready sale at these high prices. May be shipped when nearly ripe and ripen upon the journey or afterwards." (Husbands.) For distribution later.

PERSEA AMERICANA. (Lauraceae.) 31375-376. Seeds of avocado from San José, Costa Rica. Presented by Mr. C. Wercklé. "These are seeds of large, very thick fleshed and very good varieties, about the best that come to the market. In color plain green." (Wercklé.) For distribution later.

PRUNUS ARMENIACA. (Amygdalaceae.) 31281. Seeds of wild apricot from the hamlet of Chong Djighilan, Thian Shan Mountains, Chinese Turkestan, altitude 3700 feet. "Wild apricots occur plentifully here and there in the Northern Thian Shan." For further information see note from Mr. Meyer in Notes from Foreign Correspondents, Bulletin 62, this series. (Meyer's introduction.) For distribution later.

ROSA SPP. (Rosaceae.) 31291-292. Seeds of wild roses from the Thian Shan Mountains, Chinese Turkestan. One with few spines, apparently very floriferous, and of possible value for the breeding of hardier roses for the northern states, the other of use perhaps, as a stock in dry, cold regions. (Meyer's introductions.) For distribution later.

SORBUS SP. (Malaceae.) 31283. Seeds of a mountain ash from near Idin-kul, Thian Shan Mountains, Chinese Turkestan. "A so-called mountain ash, found in cool and shady places at high altitudes. Grows to be a small tree, but is usually a tall shrub. Of possible value as an ornamental park and garden tree in regions with long winters and cool summers." (Meyer's introduction.) For distribution later.

TRITICUM SP. (Poaceae.) 31368-369. Seeds of wheat from the Hoggar region, Algeria. Presented by Dr. L. Trabut, Algiers. "This wheat was received from among the Hoggar Touaregs. It is cultivated with the aid of irrigation." (Trabut.) For distribution later.

VICIA SP. (Fabaceae.) 31306. Seeds of a vetch from Kurre, Thian Shan Mountains, Chinese Turkestan, altitude 7100 feet. "A vetch found in wild harvested hay, considered by the natives to be a very nutritious food for cattle, but especially good for horses. To be tested for its possible fodder value in the northern sections of the United States." (Meyer's introduction.) For distribution later.

VITIS VINIFERA. (Vitaceae.) 31255. Cuttings of a cultivated grape from Taihoku, Formosa. Presented by Mr. G. Takata, chief of the Bureau of Industry, Formosan Government, at the request of Mr. K. Haga, Expert, Bureau of Industry. These are reported to be from vines bearing fruit of unusually high quality for tropical grapes. For distribution later.

UNDETERMINED. (Cucurbitaceae.) 31365. Seeds from Liberia. Procured from Mr. Henry Stewart, through Mr. G. N. Collins. "The seeds of this plant, when parched and ground, produce a delicious condiment. Kiffy seed is an important ingredient in the popular Liberian dish, 'dumboy'. The flavor of the parched seed is similar to that of Sesamum indicum which is used in the same way by the natives of Liberia. The gourd-like fruits, about the size and shape of a goose egg, are produced on vines like the ordinary gourd. The method of securing the seeds practiced by the Liberians is to macerate the fruits in water and wash them free from the pulp. The season required for maturing the fruit is probably too long to permit the plant being grown anywhere in this country except in the extreme south." (Collins.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

BRAZIL. Theophilo Ottoni. Mr. Fred Birch writes May 24, that they have there a little "woody nightshade", (Solanum sp.) whose berries serve in place of currants, or blueberries. It has a delightful flavor like a sweet ethereal liquorice. It grows to the size of three eighths inch in diameter, but he fears it may become a weed here as in Brazil. Of the native Lycopersicons which we requested, he has not found any with good tasting fruits, except a hard shelled form he has sent us already. All the others are most abominably acrid, and are usually troublesome weeds.

CANARY ISLANDS. Puerto Orotava. Mr. George V. Perez writes June 1, that if we wish to make experiments on a large scale with Statice arborea, he will be glad to put at our disposal all the seeds he gathers this year. He will send us seeds of Juniperus cedrus, Echium pininana and E. auberianum when he is able to get them.

COSTA RICA. San José. Mr. C. Wercklé writes June 18, "I do not know the hard-shelled Anona from Guatemala, nor the 'ilama' from Acapulco. It is strange that there are so many fine fruits in tropical America which one can scarcely find; the soncoya(a very large fruit)has orange-colored flesh and is to my taste better than the chirimoya, as it has sufficient acid and such an aroma that one can smell the ripe fruit, fallen down in the forest, when one passes near the tree. It is deciduous, with large leaves a little rough. The strongest grower I know of the genus. There are no seeds to be had now. Also the 'carrocaliente'(that interesting Coccoloba with small leaves and fine fruit)and the 'fruta de pava', that black, violet-brown-fleshed myrtaceous fruit with a single long seed. All three plants are from the Pacific Coast. Of the zapote we have very fine large varieties here

MANCHURIA. Mukden. Mr. E. C. Parker, Agriculturist of Bureau of Agriculture, Industry and Commerce, writes June 6, that he can find nothing in regard to the cultivation of the vetches in Manchuria, as the vetches are not grown there. Wild vetches do, however, occur.

PHILIPPINE ISLANDS. Manila. Mr. C. V. Piper, Agrostologist in Charge of Forage Crop Investigations, writes May 23 from Manila, where he has been investigating the forage crop situation for the War Department, that he will secure all the varieties of mangos in the islands before leaving and arrange with Mr. Wester, late of this Office, to get the others for us. He speaks of the "Carabao" as a "decidedly fine variety which breeds true to seed", and says it can be gotten at any time in season at the mere cost of the fruit, about two cents apiece. Ophicpogon, which he has seen growing both at Yokohama and the Hongkong Botanical Gardens, impresses him as "an admirable plant to cover the ground, and particularly steep slopes in very shady places".

RHODESIA. Mr. J. Speyer Sulman, Secretary of the North Charterland Exploration Company, Ltd., writes June 13, that the company will be very glad to assist us in obtaining native seeds from Northeastern Rhodesia.

SIBERIA. Saissansk. Mr. Frank N. Meyer writes June 1, that he has reached this place, and after a trip into the Altai Mountains, will proceed to Omsk to attend a great agricultural exhibition which is to be held there. On July 4 Mr. Meyer writes, that on July 2 he arrived at Omsk, whence he will send in the material collected in the Altai Mountains.

Issued August 25, 1911.

Issued August 25, 1911.

NO. 65.

July 1 to 31, 1911.

NEW PLANT IMMIGRANTS.

ACANTHOSICYOS HORRIDA. (Cucurbitaceae.) 31401. Seeds of the narras from Walfisch Bay, West Africa. Presented by Mr. Richard Hörnig, Tsumeb, German Southwest Africa. "This plant is an important dune former and continues to grow with the increasing height of the dune, so that its younger shoots remain at the surface, forming a dense thorny shrub, while the root system penetrates to a considerable depth, tapping the underground water and securing such a supply that drops exude and fall from the cut ends of assimilating stems. Flowering commences in November, and by the middle of February the female plants produce ripe fruits, which are borne in great profusion, and for about four months in the year render the Hottentots independent of other sources of food, and to a large extent, of water also. The fruits are spheroidal in shape, and about nine inches in diameter. The juicy yellow flesh is much relished by the natives, who consume large quantities of it while fresh and lay by a store for winter use in the form of hard flat cakes obtained by evaporation, and its food value is attested by their fat and sleek appearance during the narras season. The faculty of enjoying the juice evidently has to be acquired, for it has a sweet sickly flavor, and contains an acid principle very irritating to the tongue and palate of those unaccustomed to it; it is said that at the end of the narras season the lips of even the habitual consumers are swollen and inflamed. The seeds, which somewhat resemble those of the squash, are very nutritious and were formerly exported to Cape Town under the name of 'butter nuts', where they found a market among the native population and were also used by Europeans as a substitute for sweet almonds." (Pearson, Notes on a Journey from Walfish Bay to Windhuk, Kew Bull. Misc. Inf. 9:342 (1907.) For distribution later.

ANONA MURICATA. (Anonaceae.) 31383. Seeds from Piracicaba, Brazil. Presented by Mr. Clinton D. Smith, Fazenda Modelo do Estado de Sao Paulo. "Variety Cabeca de Negro. This seems to me to belong to this species and variety. There are so many variations in the trees and in the fruits that I cannot as yet clearly determine the lines of separation. The natives call this fruit 'araticu'." (Smith.) For distribution later.

BRASSICA SP. (Brassicaceae.) 31476. Seeds of Chinese cabbage from China, presented by Mr. G. Weidmann Groff,

Canton Christian College, Canton, China. "Wong nga paak. An excellent Chinese cabbage with very long head, and when blanched, of excellent flavor." (Groff.) For distribution later.

CAPSICUM SP. (Solanaceae.) 31297. Seeds of a pepper from Paraguay. Presented by Mr. C. F. Mead, Villa Encarnacion. "Called in Guarany, 'Kucii'. A very small and very strong pepper, a good rival if not stronger than the Tabasco pepper. Found growing wild in the forests of Paraguay. The seeds were procured for me by Indians near the yerbales of Alta Parana." (Mead.) For distribution later.

CASIMIROA EDULIS. (Rutaceae.) 31470. Seeds of the Matasano or white sapote from Honduras. Presented by Dr. R. Fritzgartner, Tegucigalpa. "The tree is handsome, having large, palmate leaves, glossy green on the upper surface, and with age forms a dense dome-shaped head of foliage. As an ornamental alone it is of value, and possesses good possibilities as a street and avenue tree. The fruits greatly resemble in appearance an apple or a quince, and the better varieties are as large as a good-sized apple. When fully ripe the pulp becomes quite soft, and has been described as of a delicious, melting, peach-like flavor. The normal season of ripening is October and November, but as soon as the fruit is fully developed it may be picked and ripened in the house, and is then quite as good as though ripened on the tree." (F. W. Popenoe, Pomona journal Economic Botany, 1, p. 83-90, 1911.) For distribution later. See halftone plate.

CASTILLA SP. (Urticaceae.) 31410. Seeds of a Central American rubber tree from Tula, Veracruz, Mexico. Presented by Mr. A. D. Patchen. One of the seven or eight trees of this genus capable of producing rubber. Introduced for the work of the Office in encouraging the growing of the various rubber trees in Porto Rico, Hawaii, and the Canal Zone. For distribution later.

CEIBA PENTANDRA. (Malvaceae.) 31393. Seeds of West Indian silk-cotton tree from Buitenzorg, Java. Presented by the Director of Agriculture. "A tree attaining a height of 100 feet or more, having an imposing appearance. Its bark is green and covered with rough tuberculated prickles. It tapers upward from a swollen base, around which are thick projecting buttresses of sufficient width to allow of horses being stalled between them." (Smith, Dictionary of popular names of economic plants.) "The fiber surrounding the seeds of this and related species is the 'kapok' of commerce, and is

exported in considerable quantities from the west coast of Africa." (Cook and Collins, Economic plants of Porto Rico.) For distribution later.

CHRYSANTHEMUM CINERARIFOLIUM. (Asteraceae.) 31466. Seeds of pyrethrum from Erfurt, Germany. Purchased from Haage & Schmidt. Introduced for the work of the Office of Drug Plant Investigations in growing in the United States the various species of this genus which produce the pyrethrum insect powder. For distribution later.

CITRUS SPP. (Rutaceae.) 31406-409. Seeds of citrus fruits from Buitenzorg, Java. Presented by Mr. H. Wigman, Jr., assistant Director, Botanical Garden, Buitenzorg. Citrus aurantium, var.?, two varieties of C. decumana, and C. nobilis. For distribution later.

DIOSCOREA SP. (Dioscoreaceae.) 30091. Tubers of a yampie from Kingston, Jamaica. Presented by Mr. William Harris, Superintendent of Public Gardens. "Tubers mostly of fair size, but generally rather rough and irregular in form. The flesh is very white and of good flavor when cooked, resembling somewhat the white fleshed yampie of the Canal Zone(Plant Introduction No. 29540.) (R. A. Young.) For distribution later.

FICUS PSEUDOCARICA. (Urticaceae.) 31469. Seeds of a fig from Eritrea, East Africa. Presented by Prof. T. Batorate, Director, Colonial Agricultural Experiment Station, Asmara. "We already have this species in California and it promises to be important in supplying early Blastophaga with pollen to caprify the spring crop of figs." (W. T. Swingle.) For distribution later.

MAURITIA SP. (Phoenicaceae.) 31468. Seeds of morichy from La Brea, Trinidad, British West Indies. Presented by Mr. H. Caracciolo, St. Joseph Nurseries. "A handsome palm growing about the asphalt beds of La Brea. The seeds ripen in May and could readily be gathered as the palm is abundant locally." (Oglesby Paul.) For distribution later.

MEDICAGO SPP. (Fabaceae.) 30992, 30994-31007, 31009-019, 31021-024, 31069. Seeds of thirty-one species and varieties of Medicago from St. Petersburg Botanic Garden. Presented by the Director. Among these are a number of varieties of Medicago hispida, Medicago falcata, M. lupulina, and several of the numerous Mediterranean forms. All for distribution later.

MEDICAGO LUPULINA. (Fabaceae.) 31395. Seeds of black medick from Foochow, China. Presented by Mr. T. M. Wilkinson. "A plant with low growing stems, inclined to lie along the ground and take root at the joints. Starts in new places like white clover. Leaf about the size of white clover. Blossom yellow." (Wilkinson.) For distribution later.

MEDICAGO SP. (Fabaceae.) 31467. Seeds of alfalfa from Quetta, India. Secured by Mr. F. Booth Tucker, The Salvation Army, Simla, India, from Mr. G. H. Frost, Sub-conductor, Office of Military Farm, Quetta. For distribution later.

MEDICAGO SP. (Fabaceae.) 31465. Seeds of alfalfa from Jeolikote, United Provinces, India. Presented by Mr. Norman Gill, Superintendent, Kumaun Government Gardens, Douglas Dale, at the request of Rev. N. L. Rockey, Gonda, United Provinces. For distribution later.

MECONOPSIS SIMPLICIFOLIA. (Papaveraceae.) 31025. Seeds from St. Petersburg Botanical Garden. Presented by the Director. "A perennial herb with large blue-purple flowers found on the subalpine slopes of the Himalayas at an elevation of 12000 to 14000 feet, in Nepal and Sikkim in northern India." (Skeels.) Introduced with others of the genus for trial, in the hope of finding a thoroughly hardy blue poppy, and also for possible use in breeding work with the hardier poppies already in cultivation. For distribution later.

PERSEA AMERICANA. (Lauraceae.) 31381. Seeds of avocado from Mexico. Secured on the market at Laredo, Texas, by Mr. David Griffiths, of this Bureau. "A Mexican avocado. Only one of the kind found. Brown-black in color. The outer skin, hard, rather brittle, and easily peeled off from the edible flesh. Flavor good, flesh firm." (Griffiths.) For distribution later.

PHELLODENDRON SACHALINENSE. (Rutaceae.) 30864. Seeds from Sapporo, Japan, Presented by Prof. T. Minami, Botanic Garden. "Of the three species of this genus established in the Arboretum, Phellodendron sachalinense is the handsomest. All the species are natives of eastern Asia, and are small trees with pinnate leaves, small clusters of inconspicuous yellow flowers, the male and female flowers being produced on different individuals, and black berry-like fruits; they have bright yellow wood and roots, and all parts of these trees are permeated with a fragrant aromatic oil which apparently makes them immune from the attacks of insects. P. sachalinense, which is a native of Saghalin and the northern island of Japan, has grown in the Arboretum into a tree about thirty

feet high, with a tall, straight trunk, and wide spreading branches, forming a shapely flat-topped head. The seedlings, springing up naturally near the old trees, indicate that it is likely to hold its own in New England. The hardiness of this tree, its rapid growth, and the fact that it is not injured by insects, suggest that this is a good subject to plant in narrow streets. Seeds will be sent from the Arboretum in the autumn to anyone who may desire to grow this tree." (Bulletin of Popular Information, No. 7, Arnold Arboretum, Harvard University.) For distribution later.

XANTHOSOMA SP. (Araceae.) 31371. Tubers of yautia from Monte Cristi, Dominican Republic. Procured by Mr. Frederic L. Lewton of this Bureau. "The tubers were obtained by Mr. Lewton on the market under the name of yautia. They are oblong in form, one specimen being six inches in length and two and a quarter inches in greatest diameter, with a weight of ten ounces. The sprouts are pink or reddish. The flesh is white and non-acrid; when cooked it becomes slightly purplish and is moderately firm. The flavor is rather inferior." (R. A. Young.) For distribution later.

XANTHOSOMA SP. (Araceae.) Tubers of yautia from Port-au-Prince, Haiti. Procured by Mr. Frederick L. Lewton of this Bureau. "The tubers of this variety were obtained on the market, under the name of 'Malanga', by Mr. Lewton. They are roundish in general form, some specimens being about two and one half by three inches in size and weighing five to six ounces. The sprouts are reddish in color. The flesh is acrid when raw, but this is destroyed by boiling for 35 or 40 minutes. The flesh is very firm when cooked and is of fair flavor." (R. A. Young.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

CUBA. Cienfuegos. Mr. Robert M. Grey, Superintendent of the Harvard Botanical Station, writes July 18, that he has secured for us more of the Animas Malangas, which he will send after they have fully matured. There are two varieties, one the common "malanga", the other very nearly like the Trinidad dasheen.

PHILIPPINE ISLANDS. Mr. C. V. Piper writes June 22, that he is sailing July 5 on the Mongolia for Hongkong, Canton, Singapore, and Java. He is sending a considerable number of seeds of forage crops and grasses.

feet high, with a tall, straight trunk, and wide spreading branches, forming a shapely flat-topped head. The seedlings, sprouting up naturally near the old trees, indicate that it is likely to hold its own in New England. The hardiness of this tree, its rapid growth, and the fact that it is not injured by insects, suggest that this is a good subject to plant in narrow streets. Seeds will be sent from the Arboretum in the autumn to anyone who may desire to grow this tree." (Bulletin of Popular Information, No. 7, Arnold Arboretum, Harvard University.) For distribution later.

XANTHOSOMA SP. (Araceae.) 31371. Tubers of yautia from Monte Cristi, Dominican Republic. Procured by Mr. Frederic L. Lewton of this Bureau. "The tubers were obtained by Mr. Lewton on the market under the name of yautia. They are oblong in form, one specimen being six inches in length and two and a quarter inches in greatest diameter, with a weight of ten ounces. The sprouts are pink or reddish. The flesh is white and non-acrid; when cooked it becomes slightly purplish and is moderately firm. The flavor is rather inferior." (R. A. Young.) For distribution later.

XANTHOSOMA SP. (Araceae.) Tubers of yautia from Port-au-Prince, Haiti. Procured by Mr. Frederick L. Lewton of this Bureau. "The tubers of this variety were obtained on the market, under the name of 'Malanga', by Mr. Lewton. They are roundish in general form, some specimens being about two and one half by three inches in size and weighing five to six ounces. The sprouts are reddish in color. The flesh is scrrd when raw, but this is destroyed by boiling for 35 or 40 minutes. The flesh is very firm when cooked and is of fair flavor." (R. A. Young.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

CUBA. Cienfuegos. Mr. Robert M. Grey, Superintendent of the Harvard Botanical Station, writes July 18, that he has secured for us more of the Animas Malangas, which he will send after they have fully matured. There are two varieties, one the common "malanga", the other very nearly like the Trinidad dasheen.

PHILIPPINE ISLANDS. Mr. C. V. Piper writes June 22, that he is sailing July 5 on the Mongolia for Hongkong, Canton, Singapore, and Java. He is sending a considerable number of seeds of forage crops and grasses.

RECENT CALLERS.

Prof. W. R. Lazenby of Ohio State University called en route to Brazil, Paraguay and Argentina, where he will spend the winter. While in these countries he will also collect such information and specimens for this Office as he can without interfering with his own plans. Requests for investigations along special lines and collections of special materials may be made through this Office.

Messrs. V. Kotchetkoff of the Department of Agriculture, Moscow, and D. Roodzinski, Director of the Selection Station of the Moscow Agricultural Institute, spent several days recently in a study of the work of this Bureau and especially of the work of Arlington Farm as an introduction to a six months' investigation of agricultural methods and conditions in the United States.

Mr. G. Weidman Groff of Canton Christian College, called July 10, to report on a recent trip he made across one of the less known provinces of southern China, that of Kwong Si. Many interesting fruits and vegetables were reported, and notes given us on the various crops grown. Much information was received on the general agricultural conditions of the southern provinces, where there seems to be a promise of a general movement in advance along agricultural lines.

Mr. William W. Masterson, American Consul at Harput, Turkey in Asia, in conversation July 10, called attention to several interesting fruits of that portion of Armenia and gave us the names of a number of new men recommended as possible correspondents. Among the interesting importations sent us by Consul Masterson in the past are the oleasters, or Trebizond dates, watermelons of tremendous size, and unusually fine apricots.

Issued September 12, 1911.

RECENT CALLERS.

Prof. W. R. Lazenby of Ohio State University called en route to Brazil, Paraguay and Argentina, where he will spend the winter. While in these countries he will also collect such information and specimens for this Office as he can without interfering with his own plans. Requests for investigations along special lines and collections of special materials may be made through this Office.

Messrs. V. Kotchetkoff of the Department of Agriculture, Moscow, and D. Hoodzinski, Director of the Selection Station of the Moscow Agricultural Institute, spent several days recently in a study of the work of this Bureau and especially of the work of Arlington Farm as an introduction to a six months' investigation of agricultural methods and conditions in the United States.

Mr. O. Weldman Orcutt of Canton Christian College, called July 10, to report on a recent trip he made across one of the less known provinces of northern China, that of Kwong Si. Many interesting fruits and vegetables were reported, and notes given up on the various crops grown. Much information was received on the general agricultural conditions of the southern provinces, where there seems to be a promise of a general movement in advance along agricultural lines.

Mr. William W. Masterson, American Consul at Erzrut, Turkey in Asia, in conversation July 10, called attention to several interesting fruits of that portion of Armenia and gave us the names of a number of new ones recommended as possible correspondents. Among the interesting importations sent us by Consul Masterson in the past are the oleaster, or Trebizond dates, watermelons of tremendous size, and unusually fine apricots.

Issued September 12, 1911.

NO. 66.

August 1 to 31, 1911.

NEW PLANT IMMIGRANTS.

ANONA SPP. (Anonaceae.) 31710-712. Seeds of anonas from Ceylon. Presented by Mrs. Charles B. Bigelow, Boston, Mass., through Prof. C. S. Sargent, Arnold Arboretum, Jamaica Plain, Mass. Anona muricata, the sour sop, Anona squamosa, the sweet sop, and an undetermined species, all introduced for the work of the Office in the introduction and distribution of the best anonaceous fruits. For distribution later.

ANONA SPP. (Anonaceae.) 31574-576. Seeds of anonas from Costa Rica. Presented by Mr. Carlos Wercklé, San Jose, Costa Rica. Three seedlings, from San Francisco, Costa Rica. "Bears second year, delicious." (Wercklé.) Introduced like the preceding. For distribution later.

ARRACACIA XANTHORRHIZA. (Apiaceae.) 31557. Roots from David, Republic of Panama. Presented by Mr. J. R. Lastra. "A perennial herb of the carrot family. It attains a height of two or three feet. It has divided leaves like the carrot, and small umbels of purple flowers, and has large fleshy roots, which form an important article of food in South and Central America." (Smith, Dictionary of popular names of economic plants, p, 95.) "Probably best adapted to cultivation in the Southern States, as it is slow in maturing. Well worth the attention of amateurs." (Fairchild.) For distribution later.

ANANAS SP. (Bromeliaceae.) 31558. Seeds of the ivirá from Paraguay. Presented by Mr. Thomas R. Gwynn, Capilla Horqueta, Paraguay. "Ivirá is a pineapple and produces an acid of the first class. The leaf is used for fiber, producing ropes and clothing. The plant reproduces from the root, or else from small plants formed on top of the fruit just exactly as the pineapple does. This plant is very similar to the caraguata, from which is made the best rope I have ever seen. I don't know about its being superior to anything in the United States, but I do know if you eat two or three of the crude fruit, blood flows from the lips, and the teeth are set on edge. You only can understand who have eaten green apples and sour cherries. The fruit has just the same taste as the cultivated pineapple, and the same shape, but very small. The blade is a lot narrower, the thorns shorter." (Gwynn.) For distribution later.

DIOSPYROS PEREGRINA. (Ebenaceae.) 31488. Seeds from Sibpur near Calcutta, India. Presented by Major A. T. Gage, Superintendent, Royal Botanic Garden, Sibpur. "A dense evergreen tree

found throughout the greater part of India in shady, wet places and near streams. It is frequently cultivated both for ornament and for its large, red, velvety fruits. The fruit is beaten in a large mortar and the juice expressed. This is boiled, mixed with powdered charcoal and applied once a year to the outside of the planks of boats. The half-ripe fruits are pounded in a mortar and then kept six or seven days in water until they have decomposed. A gummy solution results, which is poured off. This brownish liquid is used in dyeing and tanning." (Watt, Commercial products of India, p. 498.) For distribution later.

FEVILLEA CORDIFOLIA. (Cucurbitaceae.) 31484. Seeds of cabalonga from Costa Rica. Presented by Mr. José C. Zeledon, San Jose, Costa Rica. "A vine to cover trellises in hot countries, that bears a fruit the size of an orange. An antidote for snake bites. Would grow in Florida." (Zeledon.) "The sequa or cacoon antidote of Jamaica, where it is a common plant in shady woods, climbing to a great height up the trunks of trees. The fruits are four to five inches in diameter, and contain from 12 to 15 large flat seeds, which possess purgative and emetic properties and have an intensely bitter taste. In Jamaica the negroes employ them as a remedy in a variety of diseases, and consider them to be an antidote against the effects of poison; they also obtain a large quantity of semi-solid fatty oil, which is liberated by pressing and boiling them in water." (Lindley, Treasury of botany, p. 490-491.) For distribution later.

LINUM USITATISSIMUM. (Linaceae.) 31483. Seeds of white-seeded form of flax from Hoshangabad, Central Provinces, India. Presented by Mr. A. Howard, Quetta, India, at the request of Mr. J. D. Shanahan, formerly of this Bureau. "As regards the oil yielding capacity of this white-seeded variety I understand it is better than the country linseed, but I believe the yield of seed is less. It may, however, be of use in breeding." (Howard.) This form was secured at the request of this Office, as it is reported that the Indian white-seeded variety yields two per cent more oil than the ordinary dark linseed. For distribution later.

LUCUMA SPP. (Sapotaceae.) 31479-480. Seeds of sapotes from San Jose, Costa Rica. Presented by Mr. C. Wercklé, San Jose, Costa Rica. "A tree 30 to 40 feet high, with fulvous or grey branches, and long obovate leaves. The cream-colored silky flowers are borne in clusters on the stem. Fruit about six inches long, with reddish pulp, containing one or more polished seeds. The pulp is sweet and resembles in taste a luscious pear. It is made into a marmalade, which is said to be not unlike good apple preserve." (Macmillan, Handbook of tropical gardening, p. 153.) For distribution later.

LUCUMA OBOVATA. (Sapotaceae.) 31642. Seeds from Chile. Received through Mr. José D. Husbands, Limavida, Chile. "Lucuma

de Quillota." The skin is a bright dark green, flesh yellow, very much like a pumpkin but lighter color and more mealy." (Husbands.) For distribution later.

LYCOPERSICON SPP. (Solanaceae.) 31561-562. Seeds of wild tomatoes from Peru. Presented by Dr. A. Weberbauer, German Legation, Lima, Peru. Two forms, one a "desert plant in hot almost rainless entirely frost-free region", the other "a climbing shrub three meters high, growing in soils constantly moist, but not swampy". For distribution later.

MALUS SYLVESTRIS. (Malaceae.) 31511-31536. Cuttings of twenty-six apples from New Zealand. Presented by Mr. W. C. Berridge, Manager, Tauranga Experimental Farm, Department of Agriculture, Commerce, and Tourists. "These are cuttings of aphis resistant or aphis proof apples. Most of the varieties have been proved to be proof against the ravages of the woolly aphis, but several have not yet been fully proved to be absolutely proof against it." (Berridge.) For distribution later.

MALUS SP. (Malaceae.) 31688. Seeds of wild apples from near Kuldja, Chinese Turkestan. "Very hardy wild apples, collected in semi-arid mountains at altitudes between 5000 and 6000 feet. The trees growing at 4500 feet were in bloom at the time of visit(April 20), but those at altitudes between 5500 and 6000 feet were perfectly dormant yet." (Meyer's introduction.) For distribution later. See halftone plate.

MALUS SP. (Malaceae.) 31689-690. Seeds of apples from Saissansk, southern Siberia. One, "said to grow in gardens around Saissansk, apparently seedlings from the wild apples, occurring in the mountains", the other "a small apple of bright red color and possessing a most excellent flavour. Said to grow sparingly near Saissansk, and apparently an improved variety of Malus baccata or perhaps a hybrid. Is locally sold dried as a sweetmeat and for compote and a preserve material." (Meyer's introductions.) For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 31620-630. Seeds of eleven varieties of mango from Las Sabanas, the Canal Zone. Presented by Mr. Ramon Arias-Feraud, Panama, Republic of Panama. Introduced like the following for the work of the Office in the establishment of the mango industry in Florida, Porto Rico, Hawaii, and the Philippines. For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 31572-573, 31615. Cuttings and seeds of mangos from Costa Rica. Presented by Mr. Carlos Wercklé, San Jose. Three of the best quality mangos of the country, described as having few fibers and much meat. Introduced like the preceding. For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 31477. Cuttings of mango from Piracicaba, Brazil. Presented by Mr. Clinton D. Smith, Escola Agricola Pratica, Piracicaba. Introduced like the preceding. For distribution later.

MANGIFERA ZEYLANICA. (Anacardiaceae.) 31633. Seeds of a native Ceylonese small-fruited mango from Peradeniya, Ceylon. Presented by Dr. John C. Willis, Director, Royal Botanic Gardens, Peradeniya. Introduced as a possible stock for the common mango. For distribution later.

MEDICAGO SPP. (Fabaceae.) 31609-612. Seeds of native medicagos from Chile. Received through Mr. José D. Husbands, Limavida, Chile. Forms of Medicago arabica and M. hispida. For distribution later.

MEDICAGO SP. (Fabaceae.) 31617. Seeds of alfalfa from near Baba, northwestern Mongolia. "M. falcata? An alfalfa, found here and there in large quantities on the hills, growing between dense grass at altitudes of about 4000 feet, reaching a height of apparently not over two feet. As the cold is very intense in these regions, these plants may be tested in the most northern sections of the United States." (Meyer's introduction.) For distribution later.

MEDICAGO SATIVA. (Fabaceae.) 31687. Seeds of alfalfa from Chugutchak, Mongolia. "A strain of alfalfa said to be much hardier than the ordinary varieties, but also said to be of slower growth. While fields sown to imported Turkestan seed give three cuttings a year in Chugutchak, this variety gives but two, but while of the Turkestan alfalfa one third of the plants get killed in a severe winter, this strain is said not to suffer at all. To be tested in a cool dry region especially in Wyoming, Montana, Idaho, etc." (Meyer's introduction.) For distribution later.

PERSEA AMERICANA. (Lauraceae.) 31614, 31616, 31631. Seeds of avocados from Amatitlan and Livingston, Guatemala, and from Chile. Introduced in the effort to get the best varieties of this most promising fruit for thorough trial in southern Florida and California. For distribution later.

PHYTOLACCA DIOICA. (Phytolaccaceae.) 31482. Seeds of the Ombu from Buenos Aires, Argentina. Presented by Mr. Joseph E. Wing, agent of the United States Tariff Board. "This tree does not withstand much frost. It is the common tree of the plains of Argentina, and is seen making a dense green mound of verdure in the very dry soils, green during the worst droughts. It makes extraordinarily rapid growth. I have seen the trees fully 12 feet in diameter. It is a very tenacious tree and once

established, if it is cut down, it immediately springs into life again, but does not sucker as the growth comes from the trunk. It seems absolutely healthy and resistant. It is a tree much prized to grow near the home of the colonist or estanciero of the plains of Argentina." (Wing.) For distribution later.

PISTACIA INTEGERRIMA. (Anacardiaceae.) 31725. Seeds of zebra wood from Lahore, India. Procured by Mr. R. S. Woglum, of this department from Mr. W. R. Mustoe, Superintendent of the Botanical Gardens, Lahore. "This is the famous zebra wood of Kakra, India, which grows to be a tree 40 feet or more high, with a trunk in diameter from two and one half to three feet, or even as much as four and three quarters feet. It grows on the warm slopes of the Himalaya Mountains in northern India, usually at an altitude of from 1200 to 8000 feet. The wood is very hard and close grained, brown in color, and beautifully mottled with yellow and dark veins, whence the name, 'zebra wood'." (Swingle.) For distribution later.

RHUS VERNICIFERA. (Anacardiaceae.) 31639. Seeds of the lacquer tree from Japan. Presented by Mr. Thomas Sammons, American consul general, who procured them from Mr. Matsunosuke Yamaguchi, Nagano, Japan. "A slender-branched tree with winged leaves, attaining a height of 20 feet. It is common throughout Japan, and is cultivated for its sap, which flows from its stem and branches on being wounded. It is first cream-colored, but on exposure to the air soon turns black, and is the varnish which the Japanese use for lacquering their furniture or ornamental articles." (Smith, Dictionary of popular names of economic plants, p. 426.) "The varnish or lacquer is valuable because of its great hardness without brittleness or becoming cracked; its high lustre and mirror-like surface which remains untarnished for centuries; its resistance to the agencies which attack resinous varnishes as it is not injured by boiling water, hot ashes, hot alcoholic liquors, acids, etc." (J. J. Rein, Industries of Japan.) "Unlike ordinary paints which dry because of oxidizing properties of the oil in them, this Japanese lacquer dries better in moist than in dry air as the result of a supposed enzyme which acts upon an albuminoid in the presence of a vegetable acid and a gum. The industry is one well worthy the serious consideration of paint manufacturers." (Fairchild.) Experimenters with this tree should remember that the volatile sap causes a painful eruption on the skin of certain persons similar to that caused by our common Rhus species known as poison ivy, though probably more intense even than the latter. For distribution later.

ROSA SPP. (Rosaceae.) 31692-695. Seeds of wild roses from near Ghapsagai and Bogh-dalak, Mongolia. Among these are one

or two seemingly drought resistant, another for dry cold regions, and the curious Rosa berberifolia, with undivided leaves, more or less like those of a barberry. For distribution later.

SOLANUM TUBEROSUM. (Solanaceae.) 31537-547, 31654-676. Tubers of wild potatoes from Chile. Received through Mr. José D. Husbands, Limavida, Chile. White and yellow varieties, some of them very early, said to yield in seven weeks. For distribution later.

SOLANUM SP. (Solanaceae.) 31683. Tubers of bitter potatoes from Perene, Peru. Presented by Mr. J. A. Furlong. For distribution later.

SPONDIAS MANGIFERA. (Anacardiaceae.) 31634. Seeds from Peradeniya, Ceylon. Presented by Dr. John C. Willis, Director, Royal Botanic Garden, Peradeniya. Introduced as a possible stock for the common mango. For distribution later.

VIGNA LUTEA. (Fabaceae.) 31606-607. Seeds of a Vigna from the Philippine Islands. Received through Prof. C. V. Piper, of this Bureau. Two of thirty-seven interesting economic plants, mostly forage crops and grasses collected by Prof. Piper during his stay in the islands while investigating the forage conditions for the War Department. For distribution later.

ZEA MAYS. (Poaceae.) 31560. Seeds of corn from Buenos Aires, Argentina. Presented by Mr. Joseph E. Wing, agent of the United States Tariff Board. "I bought the Argentine maize for you in Buenos Aires. It may have much use in our country in regions like western Nebraska or Colorado, since it matures here in a climate that will not mature our maize owing to cold nights and drought." (Wing.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

BRAZIL. Bahia. Mr. Southard P. Warner, American consul, writes August 6, that the Secretary of Agriculture for the State of Bahia has promised to secure for us as soon as possible, plants of the caroá and the makimbiera, two species of Neoglaziovia, of probably great value as fibre plants suitable for culture in the driest portions of the Southwest.

CHINA. Tangshan. Rev. George F. Candlin writes July 1 that he will endeavor to get seeds of the Cedrela sinensis(Hsiang ch'un)for us, as it is cultivated in his neighbourhood for its tender leaves and sprouts, which are eaten much as the southern Chinese eat bamboo sprouts.

or two seemingly drought resistant, spotted for dry cold regions,
and the cochina Opea berberifolia, with undivided leaves, more or
less like those of a barberry. For distribution later.

CROTALARIA SUBSPICATA. (Papilionaceae.) 31837-837. 31854-876.
Seeds of wild potatoes from Chile. Received through Dr. Jose D.
Tschudi, Limavida, Chile. White and yellow varieties, some of
these very early, said to yield in seven weeks. For distribution
later.

SOLANUM GP. (Solanaceae.) 31860. Tubers of bitter potatoes
from Bureau, Peru. Presented by Dr. O. F. Cook. For distribu-
tion later.

SOLANUM MAGNIVENA. (Asclepiadaceae.) 31834. Seeds from
Royal Botanic Garden, Peradeniya. Introduced as a possible stock
for the common mango. For distribution later.

VICIA DUTZA. (Fabaceae.) 31806-807. Seeds of a Vigna from
the Philippine Islands. Received through Prof. C. V. Piper, of
this Bureau. Two of thirty-seven interesting economic plants
mostly forage crops and grasses collected by Prof. Piper during
his stay in the Islands while investigating the forage conditions
for the War Department. For distribution later.

VICIA SATIVA. (Fabaceae.) 31800. Seeds of corn from Mexico
Arroyo, Argentina. Presented by Mr. Joseph K. Wing, Agent of the
United States Tariff Board. "I bought the Argentine maize for
test in Buenos Aires. It may have much use in our country in
regions like western Nebraska or Colorado, since it matures there
in a climate that will not mature our maize owing to cold nights
and drought." (Wing.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

Mr. Courtney P. Warner, American consul,
writes (under date of July 6, that the Secretary of Agriculture for the State
of Yucatan has promised to secure for us as soon as possible,
plants of the tarod and the malanguera, two species of
Xanthosoma, of probably great value as fibre plants suitable
for culture in the driest portions of the Southwest.

Mr. Edgar Tompkins, Her. George P. Cunelin writes July 1 that
he will endeavor to get seeds of the Cedrela alvarezii(Meliaceae)
or "nuiloro", as it is cultivated in his neighborhood for its
bitter leaves and sprouts, which are eaten much as the southern
Chinese eat bamboo sprouts.

HONDURAS. Puerto Cortes. Mr. Claude I. Dawson, American consul, August 15, in sending in a quantity of the "guano palm", probably Ochroma lagopus, for test as to the value of its sawdust as a light-weight packing material for fruit instead of redwood sawdust, calls attention to the fact that "there are two grades of the wood, the first and second growth, the first being hard and coarse-grained, and therefore less suitable for making life-rafts, belts, etc., for which it is at present mostly used. The second growth is easier to market, but owing to small size - seldom over six or eight inches in diameter - proves unprofitable unless contracted for in large quantities or shipped under solid contents measurement. This measure is preferable, and with an order for 500,000 feet in hand, it could be delivered at the mouth of rivers at $10.00 U. S. per thousand. The stumpage of the tree is estimated at several million feet."

PALESTINE. Haifa. Mr. A. Aaronsohn, Director of the Jewish Agricultural Experiment Station, writes July 30, that he has just returned from a four weeks trip to Damascus, Mt. Hermon and Mt. Lebanon. He collected seeds and young plants of the cedars and a large number of seeds of various forms of Amygdalus orientalis and various Prunus species, which he has recommended strongly as dryland stocks for cultivated Prunus varieties and which he will send us later.

SPECIAL NOTE: Please note that in Bulletin 64, this series, INOCARPUS EDULIS should be No. 31374 and VITIS VINIFERA, No. 31355.

S. P. I. NOS. INCLUDED IN THIS BULLETIN.

31477, 31479-480, 31482, 31483, 31484, 31488, 31511-536, 31537-547, 31557, 31558, 31560, 31561-562, 31572-573, 31574-576, 31606-607, 31609-612, 31614, 31615, 31616, 31617, 31620-630, 31631, 31633, 31634, 31639, 31642, 31654-676, 31683, 31687, 31688, 31689-690, 31692-695, 31710-712, 31725.

Issued October 14, 1911.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 69.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

November 1 to 15, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main ob ects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Annona.	32044-046, 32083.	Ipomoea.	32084-086.
Asparagus.	32080-081, 32091.	Medicago.	32078.
Callitris.	32071.	Michelia.	32043.
Carica.	32158-159.	Oryza.	32040.
Convolvulus.	32153-154.	Passiflora.	32047-050, 32137-138.
Eugenia.	32072.	Pelargonium.	31957-975.
Garcinia.	32082.	Phaseolus.	32035.
		Undetermined.	32063.

PLATE: Date Culture in Egypt. From Photographs by Mr. Aaron Aaronsohn.

ANNONA RETICULATA. (Annonaceae.) 32083. Cuttings of the bullock's heart from Cairns, North Queensland. Presented by Prof. Charles E. Wood, manager, Kamerunga State Nursery, Cairns. Introduced for the work of this Office in bringing together all the improved varieties of this genus for trial. For distribution later.

ANNONA SQUAMOSA. (Annonaceae.) 32044-046. Seeds of the sugar-apple from Brazil. Presented by Mr. Welman Bradford, Crowley, Louisiana. "Fruta de conde. This is known as the Princess fruit; there is another variety called the Prince. In my estimation it is the best fruit that ever grew. The largest plants I have noticed are about twelve feet high, and the largest fruit about five inches in diameter." (Bradford.) For distribution later.

ASPARAGUS SP. (Convallariaceae.) 32091. Seeds of asparagus from the Caucasus. Presented by Mr. A. Schelkownikow, Chaldan Station, the Caucasus, at the request of Mr. Frank N. Meyer, agricultural explorer. A large asparagus which so impressed Mr. Meyer that he made a special effort to have seeds secured for the work now being undertaken in breeding rust-resistant forms, and also improved forms for the use of florists. For distribution later.

ASPARAGUS SPP. (Convallariaceae.) 32080-081. Seeds of asparagus from Jeolikote, United Provinces, India. Presented by Mr. Norman Gill, superintendent, Kumaun Government Gardens. Asparagus curillus, a barbed form, and Asparagus filicinus, without barbs, the latter especially introduced as a great improvement over the ordinary A. plumosus for florists' use, being much hardier and handsomer and of a different type. For distribution later.

CALLITRIS RHOMBOIDEA. (Pinaceae.) 32071. Seeds of Tasmanian cypress pine from Tasmania. Presented to the Forest Service by Mr. L. A. Evans, Hobart, and to this Office by Mr. Raphael Zon, Chief of Silvics, Forest Service. "The tree is confined mainly to the coast, where it does well on poor soils. It seems to have a slow growth, but in time reaches a height of one hundred feet and a diameter of about two and one half feet. In spite of the fact that it is chiefly a warm climate tree, it also thrives in some of the colder parts of Tasmania where there is considerable frost. It has a plain, whitish wood, without figure, and with little difference in color between the sapwood and the heartwood. Its grain is hard and close and the wood is exceedingly durable. It is largely used for piles, telegraph poles, and in general con-

struction work. It not infrequently grows in mixture with eucalyptus and when grown in the forest under moderate light conditions its form is that of a sharp cone which is tall both in proportion to the diameter and the spread of the lateral branches. There are all gradations from this form to the spreading, bushy tree found in the open. Although the tree is widely used for a great variety of purposes in Tasmania, I doubt if it would prove superior to our own conifers, and believe that the chief advantage in introducing it into Florida would probably be to furnish a comparatively soft, light wood for local use." (Zon.) For distribution later.

CARICA PAPAYA. (Papayaceae.) 32158-159. Seeds of the papaya from Miami, Florida. Grown at the Plant Introduction Garden, Miami. The two fruits from which these were taken were both grown from seeds introduced from the Canal Zone by Mr. H. F. Schultz, one producing small fruits of excellent flavor, with very tender meat, the other producing large-sized pyriform fruits of excellent quality, sometimes weighing ten pounds, and maturing in sixteen months from seed. For distribution later.

CONVOLVULUS SPP. (Convolvulaceae.) 32153-154. Seeds of so-called rose-root from Puerto Orotava, Teneriffe, Canary Islands. Presented by Dr. George T. Perez. These two, C. floridus, and C. scoparius, are among the comparatively few shrubby species of the genus. They have become rare in the islands because of the use of the roots to furnish a clear amber-colored oil with a rose-like smell, used to adulterate attar of roses. The C. floridus, locally known as Guadil, is an ornamental shrub, which in flower is one of the brightest and most attractive objects in the Teneriffe landscape. The pale powdered green of the leaves forms an excellent background for the masses of pure white flowers, which so completely cover the shrub that it appears as if covered with newly fallen snow. The plant is a rapid grower and should flower in the second or third year. (Adapted from D. Morris, Kew. Misc. Bull. 1893: 133-136.) For distribution later.

EUGENIA JAMBOLANA var. (Myrtaceae.) 32072. Seeds from Algiers, Algeria. Presented by Dr. L. Trabut. "Originally from Madagascar. A very vigorous tree bearing large leaves and large sweet fruits." (Trabut.) For distribution later.

GARCINIA SP. (Clusiaceae.) 32082. Seeds from China. Presented by Mr. George Campbell, Kia-ying chou. "This morning my boat en route to Swatow, China, stopped at a market

town and I strolled through it. I found a few specimens of a fruit called Sann pee-pah or wild loquat. It was the size of an unhulled walnut and looked like a yellow apple, save that it was spherical and marked into seven segments. It peeled like an apple. The flesh was about as thick as the hull of a walnut and very sour, but enclosed a core of seven lobes, each, save one, containing a seed. Each seed was enclosed in a sweet pulp very pleasant to the taste and suggesting the mangosteen to me." (Campbell.) For distribution later.

IPOMOEA BATATAS. (Convolvulaceae.) 32084-086. Seeds of sweet potatoes from Port Moresby, Papua. Presented by Mr. A. C. English, Barcdobo Plantation, Kapa Kapa, Port Moresby. "Seeds of three varieties that we have here in this locality, which are great tuber producers. One is a white skin and white flesh, one a white skin and deep yellow flesh, and one a pink skin and white flesh. Seeds from sweet potatoes are rarely known here, even amongst the natives who plant them extensively." (English.) May be valuable in creation of new strains of sweet potato. For distribution later.

MEDICAGO FALCATA. (Fabaceae.) 32078. Seed of alfalfa from Tomsk, Siberia. "A tall, semi-erect form of 'Sholteek' growing four to five feet in height, having much foliage and bearing large pods containing heavy seeds. Apparently very little shattering. Collected in the Botanical Garden of the University of Tomsk. To be tested for forage purposes and for hybridization exclusively." (Meyer's introduction.) For distribution later.

MICHELIA CHAMPACA. (Magnoliaceae.) 32043. Seeds from Brazil. Presented by Mr. Welman Bradford, Crowley, Louisiana. "Magnolia having yellow blooms. Not as sweet as our variety. Grows thirty feet high. It is being planted in Sao Paulo as an ornamental street tree." (Bradford.) For distribution later.

ORYZA SATIVA. (Poaceae.) 32040. Seeds of rice from Aksu, Chinese Turkestan. A local variety of wetland rice, famous throughout Turkestan, which produces very large grains of a snow-white color, which swell tremendously in cooking and always remain separate. Will probably stand a considerable amount of alkali. (Meyer's introduction.) For distribution later.

PASSIFLORA SPP. (Passifloraceae.) 32047-050. Seeds of "Maracujas" from Brazil. Presented by Mr. Welman Bradford,

Crowley, Louisiana. Seeds of several species used as fruits in Brazil, some yellow, some purple, and both large and small forms. Introduced for work in breeding with the native American maypop in the hope of producing a valuable fruit. For distribution later.

PASSIFLORA INCARNATA. (Passifloraceae.) 32137-138. Plants and seeds of the maypop of the southeastern United States, purchased from Mr. Harlan P. Kelsey, Salem, Mass., for breeding purposes. Obtained for the collection being made by this Office of all the species of this genus having edible fruits for use in hybridization work. For distribution later.

PELARGONIUM SPP. (Geraniaceae.) 31957-975. Cuttings from the Royal Botanic Gardens, Kew, England. Presented by Dr. David Prain, Director. Nineteen South African species and hybrids of this genus obtained for the work of a correspondent in breeding new forms for commercial use. For distribution later.

PHASEOLUS SP. (Fabaceae.) 32035. Seeds of a bean from the South Sea Islands. Presented by the Rev. Father C. N. Field, Boston, Mass. "I never tasted a variety as delicious as this one. They were given to me by a man who had traveled around the world. They thrived much better than ordinary scarlet runner beans, on very poor soil near Boston, grew ten feet high and were remarkably productive. They are eaten baked after removing the pods and are especially sweet." (Field.) For distribution later.

UNDETERMINED. 32063. Seeds from Brazil. Presented by Mr. Fred. Birch, Theophilo Ottoni, Minas Geraes, Brazil. "Seeds of a forest shrub which I have myself discovered here. It is a rare pleasure to find a new fruit thus! It is a shrub about four feet high of very compact growth, stem and branches tough and elastic, leaves dark green, glossy, and fairly tough, about one and one half to two inches long by one inch wide, built like so many of the leaves here for living through a long dry season. I have not yet seen the flower. The fruit is a sort of elongated cherry, about seven eighths of an inch long by three eighths to seven sixteenths of an inch thick in the middle , black or purple black and with a bright, glossy skin. They usually occur singly, strung along the branches, but sometimes there are two together. From one small shrub we have eaten, I think, about three hundred fruits. The flesh is about one eighth of an inch thick over the seed and it is soft and juicy and tastes more

like a black cherry than any other northern fruit I can think of. When I remember the size of the wild fruit which the common cherry is supposed to have originated from, I think this little fruit promises to repay cultivation well. I would suggest trying it in Florida or California or Texas. The latter place might, I think, be the best for it. From mid-August to the end of September is the time of fruiting, i. e. early spring here." (Birch.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

CHINA. Canton. Pres. C. K. Edmunds, of Canton Christian College, writes October 7 that he has just returned from a trip through Kwangtung and Kiangsi provinces, and expects to leave shortly for a journey in Yunnan and Szechuan, but so far has failed to find the wild-rice, Zizania, which we requested of him.

EGYPT. Assiout. Mr. Aaron Aaronsohn, collaborator of this Department, who is at present studying the Egyptian varieties of dates, with a view to the importation of the best varieties, writes October 25 that he has received the greatest assistance from the officers of the Department of Agriculture of Egypt, who have undertaken to bring together, pack and ship offshoots of all the varieties decided upon by him as the best suited for trial in this country. In an earlier letter he describes the "Dry land date culture" of the Mediterranean shore between Alexandria and Rosetta, where tremendous crops are grown entirely without irrigation, and a rapidly increasing area is being brought under cultivation.

Mr. Aaronsohn also writes from Assouan, October 29, that he has succeeded in finding at Assiout, the true "Wahi" date, and is arranging to secure the offshoots through the American consular agent at the place. From Assouan he is sending five selected varieties, and hopes to obtain specimens of some fine dates at the Luxor market.

FRANCE. Paris. Mr. Walter T. Swingle, who has been attending the International Congress of Genetics in Paris, writes November 5, that he has been investigating the citrus relatives of Africa, and has found two new genera and a new species. The governer general of Algeria has promised that Dr. Trabut, and M. Brunel, the Director of agriculture for Algeria, soon to be appointed, shall visit America next year. November 12 he writes, "I shall bring back in my cabin living plants of the new African bael fruits, one of these able to grow in brackish water and will be a rival of Gonocitrus angulata as a stock for Citrus in alkali lands. I go to

Africa in a day or two to attend the cotton growers' congress at Orleansville on the 20th. An important new office has just been created in the Colonial Office. M. Chevalier has been made a sort of traveling inspector of the Colonial gardens and experiment stations. He is full of energy and will be a valuable man to work with."

INDIA. Calcutta. Mr. William H. Michael, American consul, writes November 13, that he has been looking into the matter of canning mangos as practiced in India. He finds that the work is being done by a young Indian who was trained in the United States, and with machinery obtained from the United States. This young man, whose factory last year turned out 20000 cans of mangos and pineapples, and who this year expects to put up 18000 cans of mangos and 12000 cans of litchis, says that there is practically no difference in canning mangos from the methods used in canning the large freestone peaches of California. The fruit so far put up has withstood shipment to England and in the cans examined the fruit retained its flavor as well as could be expected.

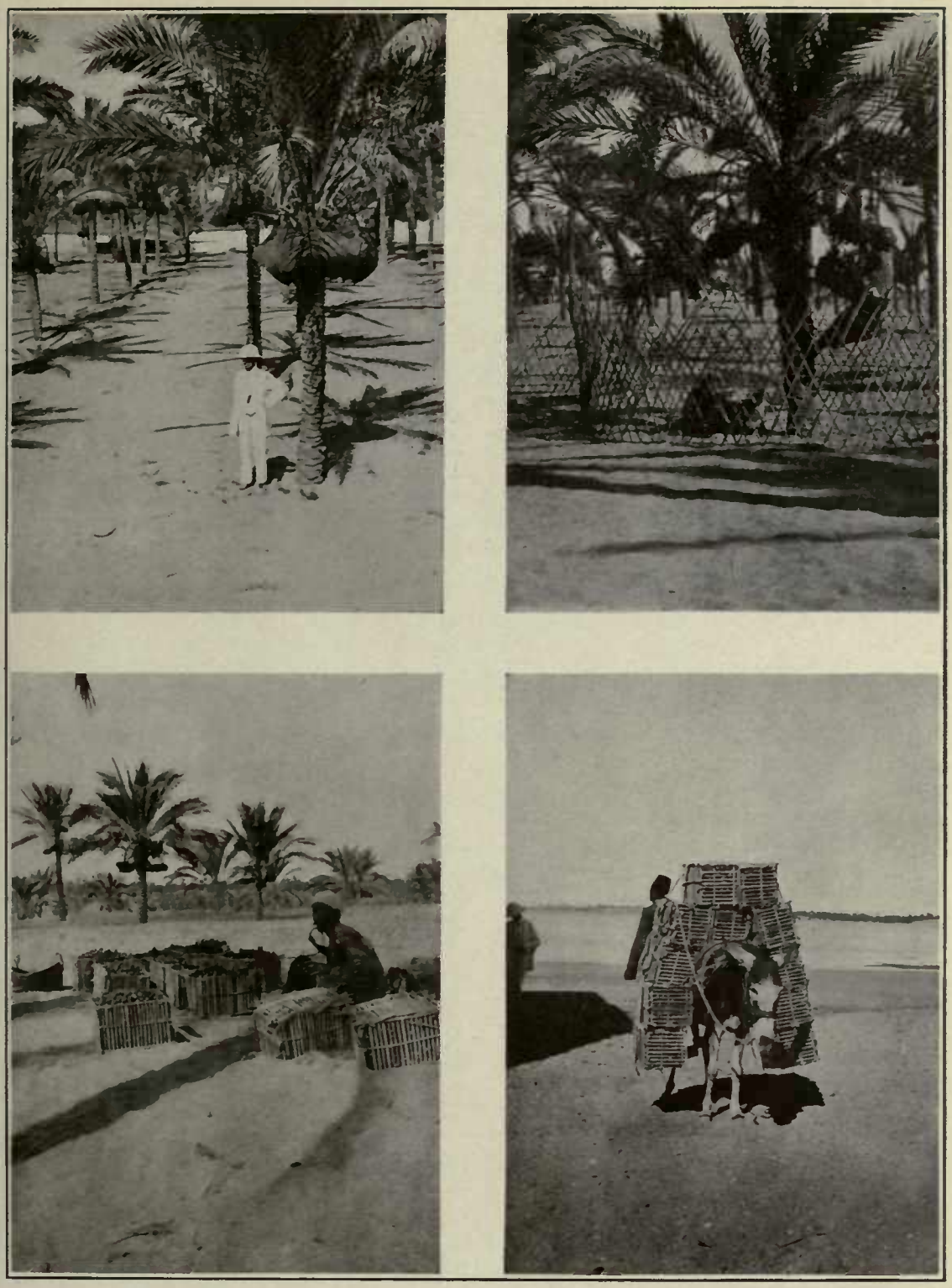
MEXICO. Zacuapam. Huatusco. Dr. C. A. Purpus writes October 31, that he has been collecting seeds and cones of Pinus rudis, P. pseudostrobus, and another which may prove to be P. teocote. On account of the insecurity of the country he was unable to ascend the peak of Mt. Orizaba in order to obtain seeds of P. hartwegii.

RUSSIA. Samara. Mr. Frank N. Meyer writes November 8, that he has returned to European Russia and will probably get into the alfalfa regions of the northern Caucasus, since the troubles in China have probably effectively prevented any work in the northwestern provinces of that country this winter.

SPECIAL NOTE.

Through the kindness of the Forest Service we are enabled to offer a small quantity of the seeds of the bigtree (Sequoia washingtoniana)to experimenters interested in cultivating this tree.

Issued December 20, 1911.



DATE CULTURE ON THE SAND DUNES OF EGYPT.

(Mr. Aaronsohn has shipped 150 offshoots representing varieties which grow without irrigation on the littoral of the Nile Delta.)

PROTECTION OF DATES BY BAGS.

PACKING FRESH DATES FOR THE CAIRO MARKET.

PICKING OUT RIPE FRESH DATES.

TRANSPORT OF FRESH DATES.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 70.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

November 16 to 30, 1911.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Benincasa.	32104.	Panicum.	32113, 32119-120.
Berberis.	32102.		
Calamus.	32108.	Paspalum.	32116.
Castanospermum.	32087.	Passiflora.	32127.
Coffea.	32160-162.	Polytrias.	32111.
Dialium.	32126.	Pterocarpus.	32121.
Helianthus.	32155.	Rubus.	32101, 32130-131.
Impatiens.	32128-129.		
Medicago.	32089.	Spondias.	32110.
Meibomia.	32114.	Syntherisma.	32117.
Myristica.	32124.	Triticum.	32156-157.

PLATE: Caravan of our Agricultural Explorer, Mr. Frank N. Meyer, in Chinese Turkestan.

BENINCASA CERIFERA. (Cucurbitaceae.) 32104. Seeds of wax gourd from Trichinopoli, India. Collected by Prof. C. V. Piper. "Large, cylindrical, twelve to eighteen inches long by six to eight inches in diameter. Very white and waxy fruit." (Piper.) This vegetable commonly used by the Chinese for vegetable soups, and also candied as a sweetmeat wherever it grows, is recommended to amateurs who are experimenting with new vegetables. It has been grown successfully near Washington. For distribution later.

BERBERIS SP. (Berberidaceae.) 32102. Seeds of a barberry from Nuwara Eliya, Ceylon. Collected by Prof. C. V. Piper. "A common species at an altitude of 6000 feet. It closely resembles B. vulgaris, but the fruits are black." (Piper.) For distribution later.

CALAMUS VIMINALIS. (Phoenicaceae.) 32108. Seeds of a rattan from Trichinopoli, India. Collected by Prof. C. V. Piper. "A peculiar fruit said to be used in curries. Flesh very acid." (Piper.) "It is a stout scrambling and climbing species, with cane thin, but strong. It makes excellent walking sticks, and is the chief rattan of the Malay Peninsula." (Watt, Commercial products of India.) For distribution later.

CASTANOSPERMUM AUSTRALE. (Fabaceae.) 32087. Seeds of the Moreton Bay chestnut from Brisbane, Queensland. Presented by Mr. Frederick Manson Bailey, Colonial Botanist. "In the scrub near Kuranda we noticed trees bearing pods about the size and shape of a banana, but at least twice the diameter. Upon opening the pods they were found to contain huge beans that look very much like chestnuts. They have a leathery skin and the interior is white and not very hard, about the consistency of a nut. I tasted one of the beans, although I was told that it was poisonous. It tasted very much like a nut, but had no distinctive flavor. In spite of the poisonous nature of the bean the 'black fellows' have learned to use it as food. They first roast the beans in hot ashes, then skin them and pound the white flesh into coarse flour. They fill a basket with this flour and place it in running water over night. In this way the poisonous principle is washed out." (Dr. Alexander Graham Bell, at whose suggestion these seeds were procured.) For distribution later.

COFFEA SPP. (Rubiaceae.) 32160-162. Seeds of coffee from Mayaguez, Porto Rico. Presented by Mr. D. W. May, Director, Agricultural Experiment Station. Three varieties of coffee from the Porto Rico Station's experimental breeding. For distribution later.

DIALIUM INDUM. (Caesalpiniaceae.) 32126. Seeds from Singapore. Collected by Prof. C. V. Piper. "Fruit like a tamarind in structure and flavor. Purchased in the market at Singapore." (Piper.) For distribution later.

HELIANTHUS ANNUUS. (Asteraceae.) 32155. Seeds of sunflower from Bezenshook, Samara Govt., Russia. "A variety of sunflower called 'Pantsernara' meaning armor plated, originated by Mr. Karsin in Russia. The seeds of this remarkable variety are provided with an extremely hard shell, being coated with silicic acid, and the weevils which have been playing such havoc heretofore with the sunflower seed crop in Russia, find it beyond their powers to penetrate the hulls of this variety. Obtained from Prof. N. M. Tulaikoff, Director of the Agricultural Experiment Station at Bezenshook." (Meyer's introduction.) For distribution later.

IMPATIENS SPP. (Impatientaceae.) 32128-129. Seeds from Peradeniya, Ceylon, and Garoet, Java, respectively. Collected by Prof. C. V. Piper. Seeds of two rose-colored species of possible ornamental value for very moist frost-free regions. For distribution later.

MEDICAGO SATIVA VARIA. (Fabaceae.) 32089. Seeds from Isère, France. Presented by Dr. L. Trabut, Algiers. Procured at the request of this Office for the collection of Medicagos now being formed for breeding work of the Office of Forage Crop Investigations. For distribution later.

MEIBOMIA SP. (Fabaceae.) 32114. Seeds from Peradeniya, Ceylon. Collected by Prof. C. V. Piper. "Similar to, but much larger than M. triflora, now abundantly established in Florida. If this proves equally aggressive it will be a valuable pasture plant." (Piper.) For distribution later.

MYRISTICA SP. (Myristicaceae.) 32124. Seeds from Batavia, Java. Collected by Prof. C. V. Piper. "A seed used by the Javanese as a cheap substitute for nutmeg. Identified by Mr. H. J. Wigman." (Piper.) For distribution later.

PANICUM SPP. (Poaceae.) 32113, 32119-120. Seeds from Karanganjar, Java, Singalong Experiment Station, Philippine Islands, and Peradeniya, Ceylon, respectively. Collected by Prof. C. V. Piper. Three species, one Para grass for comparative test, the others, creeping and decumbent species, one of which forms a good but thin turf. For distribution later.

PASPALUM MARGINATUM. (Poaceae.) 32116. Seeds from Buitenzorg, Java. "The best lawn grass at Buitenzorg and will grow in dense shade." (Piper.) For distribution later.

PASSIFLORA SP. (Passifloraceae.) 32127. Seeds of a passion fruit from Singapore. "Fruit yellow, ovoid, two inches long. Pulp subacid, seedy. Bought in the market at Singapore." (Piper.) For distribution later.

POLYTRIAS AMAURA. (Poaceae.) 32111. Seeds from Batavia, Java. "The common lawn and pasture grass of Java at low altitudes. Makes a good lawn. Horses as well as cattle eat it readily and seem to thrive upon it. Introduced in the Philippines where it is spreading." (Piper.) For distribution later.

PTEROCARPUS SP. (Fabaceae.) 32121. Seeds from Singapore. "A beautiful shade tree. Elm-like in form, but with drooping branches. Abundantly planted in the Malay Peninsula, but according to Mr. Ridley, not native. Said to differ from the true P. indicus in having larger pods." (Piper.) For distribution later.

RUBUS SPP. (Rosaceae.) 32101, 32130-131. Seeds of raspberries from Nuwara Eliya, Ceylon, and Garoet, Java, respectively. Three species, the first pink-flowered with red tomentose fruits of good flavor, the others salmon yellow, and red, sub-acid, and of fair quality. For distribution later.

SPONDIAS SP. (Anacardiaceae.) 32110. Seeds of the we fruit from Colombo, Ceylon. "Fruit smooth, oval, the size of a large hen's egg, each containing one stone. Flesh firm, yellowish, subacid, pleasant to taste, odor of pineapple. Bought in the market at Colombo." (Piper.) For distribution later.

SYNTHERISMA SP. (Poaceae.) 32117. Seeds from Batavia, Java. "A lawn grass much like St. Augustine, but hardly as good. Collected in shady ground." (Piper.) For distribution later.

TRITICUM DURUM. (Poaceae.) 32156-157. Seeds of durum wheat from Bezenshook, Samara Govt., Russia. "A large-grained uncommon summer variety of durum wheat, apparently originating in these regions," and "a new and valuable winter variety of black-bearded durum wheat having very long open ears, and proving extremely hardy, having survived snowless winters, where other winter wheats were either killed out or severely injured." (Meyer's introductions.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

ALGERIA. Algiers. Mr. Walter T. Swingle writes November 26 to Mr. W. A. Taylor, Assistant Chief, that Dr. Trabut, in charge of the Algerian Botanical Service, has offered to send us a complete collection of the more interesting native vines, including a seedling Ahmeur bou Ahmeur, the North African original of the Flame Tokay, that is of good quality without ceasing to be a good shipper! I have found a very interesting new persimmon of the South(?) Chinese type as distinguished from the Japanese type. It differs decidedly from the Kaki, has larger leaves, green fruit with an odor of jimson weed(!) when unripe. Both the common small fruited variety and a new variety with fruits measuring two and three quarters to three inches in diameter are considered superior in flavor to the red Japanese sorts. Dr. Trabut has the finest collection of citrus fruits I have ever seen, certainly far superior to anything in America. He has some twenty-five or thirty of the principal American sorts growing alongside the choicest Old World varieties. Algeria is destined to be THE orange region of the Old World - the Spanish and Italian growers will never equal the French in skill and alertness and especially in ability to fight disease. In some ways the Algerian growers are in advance of ours - not having the capital invested in old varieties as we have, they are much more ready to test new sorts, and Dr. Trabut has for ten years been collecting all the cultivated sorts from all the orange producing regions of the world. You can see in his garden the Satsuma and King from Florida; Unshiu and Kawakami from Japan; Dancey Tangerine, South African Naartjie, Clementine and Saigon No. 19 (these last two having long leaves unlike our tangerine and two months earlier, as early as the Satsuma in this climate) and a lot of other loose-skinned oranges in full bearing." In a letter of November 30 to Dr. B. T. Galloway he adds: "I was very much impressed by the value of the Clementine Tangerine which is by far the earliest of the kidglove type except the Satsuma. It is a bright red-orange medium-sized tangerine with a special flavor and aroma, not, however, so different from the ordinary tangerine as is the Satsuma. A tree sent to Florida three years ago and planted on the leased orchard at Glen St. Mary showed very marked resistance to cold - probably as much as the Satsuma. Dr. Trabut is convinced that it is a hybrid of a tangerine with pollen from the 'granito' a willow-leaved Spanish variety of sour-orange. I do not see any trace of sour orange in the Clementine, but I must admit that forms very like the 'granito' do appear among its descendants. Some of the specimens I am sending you show the punctures of the fruit-fly, Ceratitis(?). I fear this would make us a lot of

trouble if it got into America. It can live in persimmons and lots of other fruits, so it could spread into the woods around New York and gradually extend to the great fruit regions of the Eastern States."

In connection with the Ahmeur bou Ahmeur grape mentioned Mr. Taylor calls attention to the fact "that Mr. Husmann has fruited this variety in California for several seasons from stock obtained from Richter, Montpellier, France, some years ago. He is satisfied that it is distinct from Flame Tokay, though evidently of the same type."

Issued January 17, 1912.

AGRICULTURAL EXPLORER'S CARAVAN IN CHINESE TURKESTAN.

"Our large cart, with its three mules and a strong horse and over 1000 pounds of baggage in it trekking through a piece of sandy and alkaline desert. Sand dunes rise here and there above the intensely monotonous country and are mostly covered with reeds where it is swampy, or with tamarisk bushes where it is drier." From photograph by Mr. Frank N. Meyer, taken near Ure-dalik, Chinese Turkestan, February 13, 1911.

This outfit was used en route from Kashgar to Aksu, along the north border of the Takla-Makan desert. At Aksu the load was shifted to pack-horses for crossing the dangerous Mussart pass. The man in the foreground is the Russo-Turki interpreter, the other two being the driver and general helper.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 72.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

January 1 to 31, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Application for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Sed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Amygdalus	32372-380, 32662	Phytelephas	32369
Brassica	32416	Prunus	32424, 32663-665 32669-674
Bromelia	32382		
Chrysobalanus	32402	Radicula	32660
Citrus	32397-398	Ribes	32667
Cydonia	32675-676	Rosa	32668
Medicago	32389, 32408-412		

PLATE: Larix Siberica, Siberian larch.

AMYGDALUS DAVIDIANA X A. NANA. (Amygdalaceae.) 32662. Cuttings from Kozlov Tambox government, Russia. "An Amygdalus, being a hybrid between A. davidiana and A. nana. Originated by Mr. I. V. Mijurin at Kozlov, with the idea of creating a perfectly hardy peach, able to withstand the severe climate of Central Russia. This hybrid produces nonedible fruits and has the characteristic growth of A. davidiana, while the form and looks of the fruits are more or less those of A. nana. Said to be very floriferous and extremely showy in springtime. Possesses value as an ornamental tall shrub for the northern United States, and may serve as a hybridization factor in creating races of perfectly hardy peaches, as Mr. Mijurin's experiences were that while A. dividiana and A. nana do not hybridize with A. persica, this hybrid does." (Meyer's introduction.) For distribution later.

AMYGDALUS PERSICA. (Amygdalaceae.) 32372-380. Cuttings of nine varieties of Mexican peaches grown at the Government Experimental Farm, San Antonio, Tex., from seeds collected by Mr. G. Onderdonk in his investigation of the peach districts of Mexico, in 1902. Among these are forms ripening as early as June 20, others as late as September 3, some of South Chinese ancestry and others pure Spanish; several of considerable promise comparing very favorably with the Honey peach, said to be the best of the South Chinese peaches for the region of San Antonio. For distribution later.

BRASSICA JUNCEA. (Brassicaceae.) 32416. Mustard seeds from Sarepta, Saratoff government, Russia. "Seed of the famous Sarepta mustard, which is extraordinarily strong and which is in great favor throughout Russia. To possess the right pungency this mustard requires a rich, blackish soil, and a hot and dry summer, with nights not too warm. The region around Sarepta seems to supply such a desired climate. May possibly be grown to advantage in certain sections of eastern Oregon. Besides being ground into mustard powder, the seeds themselves are often eaten sprinkled over fried meats or mixed in sauces, and when used in this way they give dishes an agreeable spicy flavor. The oil expressed is not at all strong and is in very great demand in the region around Sarepta, for culinary purposes being much preferred to sunflower seed oil, as it is less adulterated. The summers in Sarepta are warm enough to ripen grapes in the open, the vines are buried deeply in the winter, however, and it may be that this short hot summer assists in making this mustard so strong, for the manager of a large mustard factory stated that seeds from Sarepta mustard grown in Tambov government, a region also with black soil, but only slightly cooler, do not possess the required strength.

Also Indian grown seed was not as fine as that cultivated near Sarepta. These seeds were obtained from the manager of the well known mustard factory of J. C. Glitsch, in Sarepta." (Meyer's introduction.) For distribution later.

BROMELIA PINGUIN. (Bromeliaceae.) 32382. Plants and seed from Tampico, Mexico. Presented by Mr. Clarence A. Miller, American consul. "Wild pineapple or Huapillo. This plant is very prolific in this section. In many places it covers thousands of acres making a thick jungle. The plant propagates from the seed and by starting suckers from the root or trunk. It flourishes in the lowlands or in the highlands. The plant is drowned out or destroyed if the land is flooded for a number of days. The leaves contain a fine quality of fiber. The fruit is used by the natives as a vermifuge. The plant itself is said to contain valuable chemical properties." (Miller.) For distribution later.

CHRYSOBALANUS ICACO. (Amygdalaceae.) 32402. Seeds of the icaco from San Salvador. Presented by Prof. A. S. Hitchcock, of this Bureau. "A common fruit sold in the markets and by street venders. Of various colors, especially a yellow and a purple variety." (Hitchcock.) For distribution later.

CITRUS DECUMANA. (Rutaceae.) 32397-398. Seeds of a pomelo from China. Presented by Mr. John M. Nixon, New York City. "The pomelo seeds were sent me by a missionary and are of the white and pink varieties of the celebrated Amoy product. The fruit is about the size and shape of our shaddock but without its dryness and bitter taste." (Nixon.) For distribution later.

COCHLEARIA ARMORACIA. (Brassicaceae.) 32660. Roots of horse-radish from Moscow, Russia. "A variety of horse-radish coming from Soosdal, Wladimir government, Russia, famous throughout the country for its fine qualities and said to be the best horse-radish in Europe. In special demand in Russia during the winter holidays." (Meyer's introduction.) For distribution later.

CYDONIA SPP. (Malaceae.) 32675-676. Cuttings of quinces from Kozlov, Tambov government, Russia. Two quinces selected by Mr. I. V. Mijurin at Kozlov, both medium sized, one with round, the other with oblong fruits. Both are able to "withstand successfully the severe climate of Central Russia, where quinces ordinarily perish when the thermometer drops to -20° Celsius (-4° F.). This variety has stood -35° Celsius (-31° F.) and remained unhurt." (Meyer's introduction.) For distribution later.

BROMELIA PINGUIN. (Bromeliaceae.) 32352. Plants and seed from Tampico, Mexico. Presented by Mr. Clarence A. Miller, American consul. "Wild pineapple or Huapilla. This plant is very prolific in this section. In many places it covers thousands of acres making a thick jungle. The plant propagates from the seed and by starting suckers from the root or trunk. It flourishes in the lowlands or in the highlands. The plant is drowned out or destroyed if the land is flooded for a number of days. The leaves contain a fine quality of fiber. The fruit is used by the natives as a vermifuge. The plant itself is said to contain valuable chemical properties." (Miller.) For distribution later.

CHRYSOBALANUS ICACO. (Amygdalaceae.) 32402. Seeds of the icaco from San Salvador. Presented by Prof. A. S. Hitchcock, of this Bureau. "A common fruit sold in the markets and by street venders. Of various colors, especially a yellow and a purple variety." (Hitchcock.) For distribution later.

CITRUS DECUMANA. (Rutaceae.) 32397-398. Seeds of a pomelo from China. Presented by Mr. John M Nixon, New York City. "The pomelo seeds were sent me by a missionary and are of the white and pink varieties of the celebrated Amoy product. The fruit is about the size and shape of our shaddock but without its dryness and bitter taste." (Nixon.) For distribution later.

COCHLEARIA ARMORACIA. (Brassicaceae.) 32360. Roots of horse-radish from Moscow, Russia. "A variety of horse-radish coming from Soudai, Vladimir government, Russia, famous throughout the country for its fine qualities and said to be the best horse-radish in Europe. In special demand in Russia during the winter holidays." (Meyer's introduction.) For distribution later.

CYDONIA SPP. (Malaceae.) 32575-576. Cuttings of quinces from Kozlov, Tambov government, Russia. Two quinces selected by Mr. I. V. Mitjurin at Kozlov, both medium sized, one with round, the other with oblong fruits. Both are able to "withstand successfully the severe climate of Central Russia, where quinces ordinarily perish when the thermometer drops to -20° Celsius (-4° F.). This variety has stood -35° Celsius (-31° F.) and remained unhurt." (Meyer's introduction.) For distribution later.

MEDICAGO SP. (Fabaceae.) 32410. Seeds of an alfalfa from near Sarepta, Saratov government, Russia. "An alfalfa of robust, almost erect growth, fit for dry situations. Is either a form of M. falcata or of M. coerulea which has been collected near Sarepta." (Meyer's introduction.) For distribution later.

MEDICAGO FALCATA. (Fabaceae.) 32389, 32409, 32411-412. Seeds of alfalfas from western Siberia, from near Sarepta, Saratov government, and from Krassny Koot, Samara government, Russia. "The 'sholteek', as this wild alfalfa is generally called in western Siberia, occurs over the greater part of Eurasia, being found in the Himalayas as low as the 30th degree of latitude and near Yakutsk and in Norway between the 60th and 70th parallels. There is a very great amount of variation to be observed in the wild plant; some forms grow up to be 5 to 6 feet tall and fairly erect, while others reach a height of a few inches only and are often of prostrate habit entirely. The more prostrate forms lend themselves excellently to naturalization purposes on dry pasture grounds, while the more erect varieties may be cultivated for forage purposes in sections of the United States were the ordinary alfalfa is winterkilled. The present habits of the 'sholteek' indicate that possibly a great amount of selection and breeding may have to be done before ideal types will have been evolved, but the many excellent qualities this plant possesses, viz., the eagerness with which all sorts of domestic animals devour it, the apparently great nutritive value, especially for milch-cows, its remarkable resistance to drought, to close grazing, and to adverse conditions in general, all seem to make it well worth while to spend some extra efforts on improvement. The roots of this 'sholteek' also possess the capacity of producing new plants whenever cut off or when exposed to the air, through the soil being washed away. This characteristic is of great value indeed in pasture grounds, where the crowns are easily damaged by the close grazing and by the hoofs of the animals tramping over them. The soil best suited to this Medicago seems to be a blackish well-drained earth, but one also finds it growing luxuriantly in pebbly banks, and in dry cliffs, composed of sandy loam." (Meyer's introductions.) For distribution later.

MEDICAGO SATIVA VARIA. (Fabaceae.) 32408. Seed of an alfalfa from Krassny Koot, Samara government, Russia. "A very strong-growing hybrid alfalfa, having heavy erect stems, which are well supplied with foliage. Obtained from Mr. W. S. Bogdan, at Krassny Koot, who is making extensive selection and hybridization experiments with Medicago falcata and who has

obtained a number of very promising types, some of which are fit to be raised for hay exclusively, while others lend themselves better to pasturing purposes. The climate around Krassny Koot is of a severe continental nature. The summers are hot and dry and the winters long and cold, with very little snow as a rule. The Medicagos selected there may prove suitable to the drier portions of the western United States especially. The plant from which these seeds came bears Mr. Bogdan's number 158 and is one of his best types." (Meyer's introduction.) For distribution later.

PHYTELEPHAS SP. (Phoenicaeae.) 32369. Seeds of vegetable ivory from Panama. Presented by Mr. M. B. Shantz, Rochester, New York. Since the button manufacturers of Rochester alone use about 15 tons per week of these nuts, at $60 to $80 per ton, the plants grown from these seeds will be tested for the possibility of growing them in southern California or southern Florida. For distribution later.

PRUNUS SPP. (Amygdalaceae.) 32424, 32669-673. Seeds and cuttings of hybrid plums from Kozlov, Tambov government, Russia. Hybrids between Prunus spinosa and Prunus domestica, variety Green Reine Claude. All originated by Mr. I. V. Mijurin, and of varying degrees of value, most of them keeping and shipping well, as well as being very productive and very hardy. For distribution later.

PRUNUS ARMENIACA. (Amygdalaceae.) 32663. Cuttings of an apricot from Kozlov, Tambov government, Russia. "An apricot originated by Mr. I. V. Mijurin in Kozlov, said to bear large yellowish fruits of good flavor. Withstands unprotected the severe climate of central Russia and is probably the hardiest variety of apricot known on the globe." (Meyer's introduction.) For distribution later.

PRUNUS AVIUM. (Amygdalaceae.) 32674. Cuttings of a cherry from Kozlov, Tambov government, Russia. "A large-fruited variety of cherry, originated by Mr. I. V. Mijurin. Fruits large, of pale red color, fresh sour-sweet flavor, ripening toward the end of June. Possess excellent shipping and keeping qualities and persist on the trees even when overripe. Trees of vigorous straight growth, making but few side branches; trunks smooth and clean. This cherry seems to give special satisfaction in dry, cold climates like for instance in Samara government, where cherries as a rule grow very poorly." (Meyer's introduction.) For distribution later.

RIBES AUREUM. (Grossulariaceae.) 32667. Cuttings of a currant from Kozlov, Tambov government, Russia. "A variety of golden currant, said to bear large fruits of good sweet flavor, ranging in color from dark purple to pale yellow. Extremely hardy and thriving even on the poorest soils. Originated dy Mr. I. V. Mijurin at Kozlov." (Meyer's introduction.) For distribution later.

ROSA PIMPINELLIFOLIA X RUGOSA. (Rosaceae.) 32668. Cuttings of a rose from Kozlov, Tambov government, Russia. A rose, hybrid between Rosa pimpinellifolia and R. rugosa. Of low dense growth and exceptionally hardy. Flowers said to be large and of pale rose color. Originated by Mr. I. V. Mijurin at Kozlov." (Meyer's introduction.) For distribution later.

SPECIAL NOTE.

Since this bulletin was prepared COCHLEARIA ARMORACIA has been changed to RADICULA ARMORACIA.

NOTES FROM FOREIGN CORRESPONDENTS.

ARGENTINE. Buenos Aires. Mr. C. F. Mead writes January 24 that for the present his work in Paraguay will be suspended and he will be with the Buenos Aires al Pacifico, a road serving a district from that city to the borders of Chile. He expects to resume his Paraguayan work in about six months, however.

ARGENTINE. Rio Negro. Maquinchao. Dr. Bailey Willis writes Nov. 27,1911, that his party is now working in the high plateau region of central Patagonia and the Andes, where they will continue until next autumn, returning to the lower lands for the winter. So far they have seen little that might interest us, but he sends in a list compiled by a local manager for an English company, which describes and gives the local names for a number of interesting dry land plants. In addition he makes the following offer: "If in August, 1912, you can send a specialist of your Department to Buenos Aires I can meet his expenses and provide outfit for him to work from San Antonio across Patagonia and the Andes, up to the end of November, giving him three months in the field. For you he should get whatever imformation this region may yieid for your purposes. For the Forty-first Parallel Survey, I would ask him to prepare a report on the flora, which should be published as a volume of the monograph which I hope to get out,

with the aid of the Argentine Government, on the scientific results of our work. Our topographic maps will cover a zone 50 kilometers wide extending from San Antonio to the Chilean boundary, and we are trying to map the geology and the soils. I would propose that your specialist should map the botanical formations."

CEYLON. Peradeniya. Dr. John C. Willis writes November 30 that he is leaving immediately for England, where he will spend the winter, leaving for Rio de Janeiro in April or May to assume his duties as Director of the Rio de Janeiro Botanical Garden.

RUSSIA. Rostoff-on-Don. Mr. Frank N. Meyer writes Dec. 9, 1911: "We visited on November 17th the School of Gardening, which is situated near Penza and which is considered one of the best schools of the sort in Russia. It was a dark, misty day and not quite fit to walk over half-frozen earth roads and glide from one mudhole into the other, but weather in Russia is a topic one leaves at rest, for it gets to monotonous. So we saw at that School a very interesting old neglected arboretum, with large specimens of Pinus strobus, Picea siberica, Larix siberica, Hippophae rhmnoides, Malus baccata, M. prunifolia, Juglans cinerea and other trees. We also saw a newly laid-out arboretum, with small specimens of most of the every-day trees and shrubs and along the roads there were various hardy herbaceous perennials. Then we saw the fruit plantations. Mr. Sokoloff, who is in charge of the outdoor plantings, took us around, through thick and through thin; they have about 60 varieties of apples in cultivation, but the 2 leading sorts are Antoneffka and Anees, but of both there some sub-varieties. They have experimented with various stocks and have come to the conclusion that Malus prunifolia is the best all-around stock for the black soil around Penza. They find it difficult, however, to obtain pure prunifolia seed, as this apple readily hybridizes with M. sylvestris and M. baccata. They also found that the Antoneffka apple is better able to grow on low places than any other variety. As a contribution to the uncongeniality of the East-Central Russian climate, I was told that this year they experienced a frost of 8° Reaumur in May (+14° Fahr.) and that while everything commenced to bloom. They lost of course a whole lot of fruit. Many years ago they also started a collection of dwarf fruits, but, such things are apparently not fitted for climates like around Penza, at least they almost produce no fruit at all, as the blossoms freeze nearly every spring. There are also many greenhouses in the School grounds and I saw some pretty flowers, which are sold for revenue. The heating of

greenhouses throughout Russia is still with flues, so one cannot expect cut flowers like one sees in America. Plants, however, coming originally from countries with fairly dry air, like Cyclamen persicum, Cineraria hybrida, (fr. Canary Islands), Cape of Good Hope plants, these all do better in flue-heated houses than in steam or hot water warmed conservatories and I noticed some very fine flowers on the Cyclamens."

Mr. Frank N. Meyer writes December 10, 1911, from Rostoff-on-Don, Russia: "Mr. Bogdan has now at Krassny Koot about 5 desiatines (13½ acres) in M. falcata, one block of 4 des. sown broadcast and the rest in smaller parcels, among which there are blocks where the selected plants are given extra care. Of these selected types he has about 400 specimens, all differing from one another, for this M. falcata is wonderfully variable; among these 400 however there are about 15 types which possess all factors that make them good fodder plants, viz., of strong upright growth, plenty of foliage, good seed producers and the pods not easily springing open or dropping off. Several of these types are hybrids between M. sativa and M. falcata. It seems also, however, that M. falcata gradually passes over into M. sativa, for there are forms of the first with bluish flowers and somewhat spiralled pods. (This is apparently the form Medicago coerulea!) Mr. Bogdan shares my opinion that M. falcata lends itself to the development of many types, some of which are of value on various sorts of pasture grounds, some for various sorts of hay-lands and some fit to be grown for fodder exclusively; various localities will have to develop varieties best suited to local conditions.

Mr. Bodgan showed me several hybrids of M. falcata x M. sativa that were perfectly sterile, though of good habits otherwise. His experiences with sowing were that the seed possesses from 30-80% germinating powers. Some plants become good sized plants in one season, bearing seeds even, while others grow very slow and do not bear until the third year. Some plants stand cutting twice, while others make no growth after having been cut once. The finest quality of M. falcata is that it stops growing when the hot and dry weather arrives, thereby saving itself, while M. sativa tries to push out and weakens itself so that the plants die out after three years. Mr. Bogdan found out that a thin stand suits M. falcata much better than being sown thickly and to accomplish such a thin stand he mixes the seed throughly with old millet seed (proso, Panicum miliaceum) that does not germinate any longer and gets his plants at the right distances. Next year he hopes to have 20 desiatines (54 acres) in M. falcata, so as to begin to supply the farmers with seed. The climate there in Krassny Koot is a real Steppe climate. In July, 1911, it was 108°

Fahr. ir the shade and in January it gets down to -31° Fahr. The average rainfall for 33 years is 282 mm.

Mr. Bogdan's opinion of this M. falcata is that it will become an important forage plant in all such sections of Russia where the summers are hot and dry and the winters cold and with little or no snow.

A second specialty of Mr. Bogdan is the selection of Agropyron cristatum and in this he has been almost more successful even than with with M. falcata. He has about 15 distinct strains, some tall, some low, some fit for very dry places, others for moister places and he is still getting better types. This grass has been proved such a success in south Russia that the farmers prefer it to the ordinary alfalfa, for it is far more drouth resistant, does not freeze out and gives an early crop of fine hay. The sub-species, A. desertorum, can be mown in early June. The commercial part of the growing has been turned over to the local Zemtsvo Agricultural Society, which has 70 desiatines in this grass and they have an order on hand for 1,000 pood from the Kharkoff Agricultural Society. It sells at Krassny Koot for 8 Roubles per pood and Mr. Bogdan stated that we could obtain perhaps 20 poods yet of this year's seed. This seed is of course composed of all strains and perhaps some few other grasses in between, but it is all right for general purposes.

Besides these two main crops Mr. Bogdan works with Agropyron repens and A. ramosum. Of the first he had selected some types that give a wonderfully good stand on low places, which are inundated in the spring, and of the latter he has some very strong growing forms, fit for stony lands. Mr. Bogdan is very enthusiastic about A. repens, which he says exists in as many sub-races as A. cristatum does. Then he also keeps his eyes open for promising wild plants and has a number of various things under observation which however I could not see, as everything was cleaned off by winds and frost. He also thinks that among the many species of Astragalus there are some fit to be grown as forage plants. He invited me to come back toward the end of June, as everything is at its best then in the south Volga regions.

Mr. Bogdan also found the genuine Medicago media Litv. which is quite distinct from M. media of cultivation; it occurs in the southern part of the Astrakhan Territory near the salty lakes of Kamish-Samarski in Turgaisky and Uralsky counties. He donated me a herbarium specimen, but the few seeds he collected had been sown already; later on perhaps he could send us some. The plant is of slender growth and has by no means the promise of a successful forage plant, like M. falcata, M. coerulea and M. glutinosa have.

Medicago ruthenica is not much of a success at Krassny Koot. It remains too low and is of semi-prostrate habits.

Medicago cancellata had been received this spring from Mr. von Arapow, but only one plant had come up and that fellow looked suspiciously like Cytisus biflorus, which is very common throughout the south Volga regions.

Mr. Bogdan had recently gotten a wheat specialist as assistant and from the last I heard, the climate around Krassny Koot is suited to a small number of wheats only. The short durum grained wheats, with the bracts close together, thrive best of all. The famous select Svalöf wheats were hopeless failures, but some varieties from hot and dry Turkestan did well, like for instance a biscuit wheat from Khiva, Triticum aestivum graecum, "Khivinka", of which I obtained a small sample. Bjela Turka wheat, one of the standard durum wheats of south Russia, is not altogether fixed; it breaks up in 7 or 8 different strains there in Krassny Koot. This assistant said that for localities like Krassny Koot people had to breed their own races of wheat and to be very careful in importing seed from other localities, as the imported wheats nearly always degenerated the first year and that now especially the whole of southeastern Russia was in a sorry plight, because the crops had been hopeless failures this year and on many places there was not even grain enough left, so the farmers were already importing wheats that are not suited to local conditions. What they are trying to obtain especially in southeastern Russia are races of perfectly hardy winter wheats and next to that, varieties that need less moisture or less time to ripen. The selection work was too recently started to show any results but the first indications are very promising; one wheat of which the type produced 13 poods to the desiatine, gave 41 poods this summer."

LARIX SIBIRICA. Siberian larch.

"A very large specimen of this tree which proves to be a very much faster grower in the north of Russia than any other larch. This specimen is not over 40 years of age." From photograph by Mr. Frank N. Meyer, taken at Liesnoi near St. Petersburg, Russia, December 17, 1909.

After having seen the tree in its native forests throughout his Siberian journeys, Mr. Meyer says, "The Siberian larch is a splendid timber tree, occurring in localities even up to 8000 feet and where the growing season is not over 10 weeks; this larch grows faster than any other cold-enduring coniferous tree and its lumber is prized by Russian settlers in the Altai above any other wood."

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 73.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

February 1 to 29, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Application for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Abies	32706	Garcinia	32704	Pistacia	32827-828
Carex	32892	Hordeum	32767	Prunus	32757-759
Citrus	32875	Lilium	32764	Pyrus	32733-747
Clematis	32763	Olea	32880	Ribes	32761-762
Cracca	32777-778	Persea	32691-694	Strychnos	32705
Diospyros	32748-750		32842	Triticum	32680-689
	32863-874		32874		32765-766
	32886	Phoenix	32713-725	Ulmus	32829-831
Ficus	32752		32845-859	Vitis	32879
	32875		32894-900		

PLATE: Prunus avium. Russian cherry.

ABIES NUMIDICA. (Pinaceae.) 32706. Seeds from Babois. Presented by Dr. L. Trabut, Algiers, Algeria. "This tree grows with the cedar (Cedrus atlantica.) It is a very splendid tree, flourishing here at 800 meters elevation." (Trabut.) For distribution later.

CAREX PHYSODES. (Cyperaceae.) 32892. Seed of a sedge from Peshy Kara Kum desert, Turkestan. Presented by Mr. W. W. Mackie, director of the Yaqui Valley experiment station, Esperanza, Sonora, Mexico. "This carex grows abundantly on the loose desert sand of the Peshy Kara Kum desert of southern Turkestan. It produces excellent feed for horses, camels, sheep, donkeys, etc., with less than four inches of rain per annum. It grows only in the loose sand. To protect itself from the elements when the roots are exposed by the winds each root and rootlet gathers about itself a layer of sand several times its diameter, holding it against considerable strain and wear." (Mackie.) This sedge had been introduced earlier by Meyer, who procured it at Chardchui, where it is used in Mr. W. A. Palletzky's sandbinding experiments along the Trans-Caspian railroad. For distribution later.

CITRUS NOBILIS. (Rutaceae.) 32875. Cuttings of the Clementine tangerine from Algiers. Presented by Dr. L. Trabut. "I was very much impressed by the value of the Clementine tangerine which is by far the earliest of the kidglove type except the Satsuma. It is a bright red-orange, medium-sized tangerine with a special flavor and aroma, not however so different from the ordinary tangerine as is the Satsuma. A tree sent to Florida three years ago and planted on the leased orchard at Glen St.Mary showed very marked resistance to cold, probably as much as the Satsuma. Dr Trabut is convinced that it is a hybrid of a tangerine with pollen from the 'granito', a willow-leaved Spanish variety of sour-orange. I do not see any trace of sour-orange in the Clementine, but I must admit that forms very like the 'granito' do appear among its descendants." (W. T. Swingle, in letter of November 30 to Dr. Galloway.) For distribution later.

CLEMATIS SP. (Ranunculaceae.) 32763. Seeds of a clematis from Kozlov, Tambov government, Russia. "A woody, climbing clematis of ornamental value, bearing large yellow flowers, which has proven perfectly hardy in Central Russia. Obtained from Mr. I. V. Mijurin, who stated he had received the seeds from Tibet." (Meyer's introduction.) For distribution later.

CRACCA. (Fabaceae.) 32777-778. Seeds from the Botanical Gardens, Buitenzorg. Procured by Mr. C. V. Piper of this

Department. Two legumes secured along with a number of others as promising plants for green manure crops. For distribution later.

DIOSPYROS SP. (Ebenaceae.) 32863. Cuttings of a wild persimmon from Tangsi, China. Presented by Rev. Alex. Kennedy, through Rev. J. M. W. Farnham, Shanghai, China. These cuttings are supposed to be from the same striking whitebarked variety described in Meyer's bulletin on Agricultural explorations in China, as being used as a stock for the cultivated persimmon in central China, and illustrated in plate III, fig. 1, of that bulletin. For distribution later.

DIOSPYPOS KAKI. (Ebenaceae.) 32748-750, 32864-872, 32886. Cuttings and plants of various Japanese varieties of persimmon from Sapporo, Yokohama, and Hiroshima, Japan. No. 32750 is composed of scions from male persimmon trees, for which special requests have been made, since practically all the trees now growing in this country from imported cuttings produce either female flowers only or male flowers in entirely insufficient numbers to supply an adequate amount of pollen. For distribution later.

FICUS SP. (Moraceae.) 32878. Cuttings of the Isabella fig from Granada, Spain. Received from Mr. Pedro Giraud, at the request of Mr. Wm. A. S. Davenhill, British vice-consul. "This is cultivated extensively, I might say preferably, in and about Granada. It is a medium-sized fig, rounded turbinate, white in color with reddish pulp. In shape it resembles the hirta of Japan with a well set neck. It is an exceedingly good fig, and one of the best table varieties I have tasted. It was ripe in September and we had good fruit yet in November, a long season for any fig. This fig, as far as I know, has not been introduced to California." (Dr. Gustav Eisen, at whose suggestion the cuttings were obtained.) For distribution later.

FICUS ROXBURGHII. (Moraceae.) 32752. Cuttings from the Calcutta Royal Botanical Gardens, Sibpur, Calcutta, India. Presented by Major A. T. Gage, Director. An Indian species with fruits up to 3½ inches in diameter introduced for breeding purposes. For distribution later.

GARCINIA SP. (Clusiaceae.) 32704. Seeds from Inhambane, Portuguese Africa. Presented by Rev. Pliny W. Keys, Methodist Episcopal Mission. "Native name pembe. Either a branched bush, an erect tree, or a bushy tree, in each case the stems set with numerous firm, little, more or less evergreen

branches which give the tree a pyramidal shape. Leaves usually in threes or opposite. Fruit one or two inches long, oblong, edible, yellow at first or when ripe, two seeded, and used by the natives to make a fermented liquor. Abundant in sandy soil through the M'Chopes country to Inhambane." (Sim, Forest Flora of Portuguese East Africa.) Introduced as a possible stock for the mangosteen, Garcinia mangostana. For distribution later.

HORDEUM VULGARE. (Poaceae.) 32767. Seeds of barleys from Rostoff-on-Don, Russia. "A new variety of black summer barley, having smooth awns. It is a decided improvement on the ordinary barleys with their objectionable barbed awns, and especially for feeding purposes. Obtained at the Agricultural experiment station near Rostoff-on-Don through Mr. S. M. Groobnieff, secretary of the Don-Kuban-Tersk agricultural society. This barley seems to do well in regions with rather high summer temperatures and where there is only a relatively slight precipitation." (Meyer's introduction.) For distribution later.

LILIUM SP. (Liliaceae.) 32764. Seeds of a hybrid lily from Kozlov, Tambov government, Russia. "A hybrid lily, originated by Mr. I. V. Mijurin, at Kozlov, bearing large flowers of deep yellow color and being extraordinarily floriferous. Of great promise apparently as an ornamental perennial for the hardy border. Bulbs of this hybrid are stated by Mr. Mijurin to weigh up to 6 pounds apiece." (Meyer's introduction.) For distribution later.

OLEA EUROPAEA. (Oleaceae.) 32880. Cuttings of an olive from Granada, Spain. Received from Mr. Pedro Giraud, at the request of Mr. William A. S. Davenhill, British vice-consul. "Cuatro Hermanos, from Canales. These olives are of good size and early maturity, ripening in November. They occur in fours, sitting close together and forming a cross with four arms on the very stem. It is said to be one of the best olives for both oil and pickling. Olives from this locality are considered some of the hardiest and are suited to districts situated on the limits of possible olive culture, Canales being about 4000 feet above Granada and 6000 above sea level, and subject to heavy winds, heavy frosts and winter snows. Still olive culture is profitable around Canales and every available space of ground is covered with trees." (Dr. Gustav Eisen, at whose suggestion the cuttings were procured.)For distribution later.

PERSEA AMERICANA. (Lauraceae.) 32691, 32842, 32874. Seeds of avocados from the state of Puebla, Mexico, presented

by Mr. William W. Canada, American consul, Vera Cruz, from Guatemala city, Guatemala, presented by Mr. George A. Bucklin, Jr., American consul-general, and of another from Guatemala City, presented by Mr. S. Billow, "said to be the largest and most delicious flavored variety that is grown in Guatemala, in season in February." For distribution later.

PERSEA LINGUE. (Lauraceae.) 32694. Seeds from the state of Puebla, Mexico. Presented by Mr. William W. Canada, American consul, Vera Cruz. A Chilean tree introduced in the effort to secure all species of this genus for breeding purposes. For distribution later.

PERSEA MEXICANA. (Lauraceae.) 32692. Seeds from the state of Puebla, Mexico. Presented by Mr. William W. Canada, American consul, Vera Cruz. Introduced for the same purposes as the preceding. For distribution later.

PHOENIX DACTYLIFERA. (Phoenicaceae.) 32713-725. Suckers of dates from Egypt. Procured through Mr. A. Aaronsohn, managing director, Jewish agricultural experiment station, Haifa, Palestine, from the Department of Agriculture at Cairo. Suckers of thirteen varieties of dates, five of them drying dates from Upper Egypt, all selected by Mr. Aaronsohn during his investigations of the Egyptian date industry in September and October of last year. For distribution later.

PHOENIX DACTYLIFERA. (Phoenicaceae.) 32845-859. Seeds of dates from Gourara, Algeria. Presented by Dr. L. Trabut, Algiers, at the request of Mr. W. T. Swingle, of this Deprtment. Fifteen varieties. For distribution later.

PHOENIX DACTYLIFERA. (Phoenicaceae.) 32894-900. Seeds of seven varieties of dates from Siwa Oasis. Procured by Mr. George J. Salem, Cairo, Egypt. For distribution later.

PISTACIA VERA. (Anacardiaceae.) 32827-828. Seeds of the pistache from Russian Turkestan. Purchased from Mr. Vladimir F. Gnesin, Tashkent. From the northernmost range of this valuable nut tree. For distribution later.

PRUNUS SPP. (Amygdalaceae.) 32757-759. Seeds of plums from Souchodole, Tula government, Russia. Three wild plums, all from the Ussuri district, Eastern Siberia, obtained from Mr. D. D. Kashgaroff at Souchodole. (Meyer's introduction.) For distribution later.

PYRUS COMMUNIS. (Malaceae.) 32733-747. Cuttings of

fifteen varieties of pears from Collegeville, Minn. Presented by Rev. John B. Katzner, superintendent of the Minnesota state horticultural society trial station. All procured from Germany, and well known German varieties, none of which are hardy at Collegeville, but since they showed no signs of blight they may be worth trying in milder regions. For distribution later.

RIBES SPP. (Grossulariaceae.) 32761-762. Seeds of currants from Souchodole, Tula government, Russia. One black and one brownish-black currant, both with fruits of unusual size, one of them of fine flavor. Obtained from Mr. D. D. Kashgaroff. (Meyer's introductions.) For distribution later.

STRYCHNOS SP. (Loganiaceae.) 32705. Seeds of the quaqua from Inhambane, Portuguese East Africa. Presented by Rev. Pliny W. Keys, Methodist Episcopal Mission. "Quaqua. A small tree three to ten meters high, without thorns, and with exceedingly variable leaves. Fruit one celled, globose, five to seven cm. in diameter, small, thin, spotted, with a hard shell, and numerous flat seeds lying in acidulous edible pulp. Abundant from Natal to Inhambane, and especially on sandy soils." (Sim, Forest Flora of Portuguese East Africa.) For distribution later.

TRITICUM SPP. (Poaceae.) 32680-689. Seed of wheats from Argentina. Presented by Dr. Carlos Thays, Director, Botanic garden, Buenos Aires. Ten varieties from various parts of the Argentine Republic, varying widely in yields. For distribution later.

TRITICUM SPP. (Poaceae.) 32765-766. Seeds of wheats from Kharkoff, Russia. Two forms of winter wheat, one bearded and one beardless, both giving abundant crops and standing winter cold and summer heat better than most other wheats. Obtained from Mr .P. V. Budrin, director of the Kharkoff experiment station. (Meyer's introductions.) For distribution later.

ULMUS SPP. (Ulmaceae.) 32829-831. Plants of elms from the Imperial estate "Murgab", Bairam-Ali, Oasis of Merv, Russian Turkestan. Three very remarkably ornamental elms which stand considerable heat and fair amounts of alkali in the soil. These trees form one of the most striking features of the Turkestan landscapes. (Meyer's introductions.) For distribution later.

VITIS VINIFERA. (Vitaceae.) 32879. Cuttings of a grape from Granada, Spain. Received from Mr. Pedro Giraud, at the

request of Mr. William A. S. Davenhill, British vice consul. "Jeresiana. This is the predominant grape in Granada. It resembles the Verdal as grown in California, but is sweeter, though perhaps smaller in size. Its pulp is firm and stands shipment well and the large white bunches seem as perfect after having stood the transportation over country roads as if they had just been picked from the vine. It is a very desirable grape for the table, and one which seems suited to a high altitude. It is also a good bearer, a hardy plant, and altogether a profitable table grape. I have not observed it in California." (Dr. Gustav Eisen, at whose suggestion the cuttings were secured.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

Mr. Frank N. Meyer writes from Kozlov, Tambov government, Russia Dec. 29, 1911, concerning the work of the foremost Russian plant breeders and referring to material which is sent in:

"All of this material is extremely valuable and represents years of patient work on the part of Mr. I. V. Mijurin, here in Kozlov, who was so kind as to allow me to clip off these twigs which I am herewith sending. He stated however, that he would like to see the source of origin mentioned when we are distributing this material, as his experiences have often been that his own creations have been given new names and been sold as the seller's own products. I trust you will kindly remember these wishes of his. Mr. Mijurin has been described as the Luther Burbank of Russia, and I must confess there is much resemblance between them in their work and methods only the first took a northern locality to pursue his work in and therefore are his products really of more value to the northern states than those of Burbank, and it gives me particular pleasure that I am rounding up this present exploration trip with a few real hardy things.

I will make a few remarks re these numbers.

No. 32662, A hybrid between Amygdalus davidiana and A. nana, is extremely interesting to us, as this plant may afford us a medium by which to create a perfectly hardy peach. Mr. Woeikoff, near Syzran, was wrong when he told me that the plants he had were hybrids between A. persica and A. nana, and I was right in my remarks that they looked strikingly like A. davidiana.

No. 32663, An apricot, standing the severe climate of Central Russia, is something marvellous! The tree does not seem to be a vigorous grower, but maybe we can develop better strains by selection and hybridization.

that after 3 years only 15 specimens remained. These he took care of and budded on Prunus spinosa, but some peculiar disease came and killed them one after the other. It was bark r o t, he said, that formed a blak ring right around the little trunk close to the ground. Now he is hunting for peaches from the northernmost limits and at the same time has made hybrids between Amygdalus hybrida and Elberta peaches and others. The plants he obtained are 2 years old now and resemble Amygdalus nana more than A. persica; the fruits, however, may be different. I was not shown these little trees, for they were covered up, being too valuable to be left unprotected.

Mr. Mijurin further has hybridized pears extensively and seems to have obtained some really important forms, able to stand much more cold than the ordinary types.

In apples I also noticed many hybrids , not only Malus sylvestris x M. prunifolia, but also M. sylvestris x M. medwietzkyana and with M. baccata. Some seem to be good, but the greater part are of course valueless. The M. medwietzkyana hybrids were interesting, as half of them were red-wooded and half white-wooded and one specimen was half red and half white. Then there were hybrids between Prunus prostrata and P. spinosa; between P. insititia and P. chamaecerasus,between P. domestica and P. spinosa and various crosses between all these species.

I also heard that Amygdalus davidiana freezes in Kozlov and also Prunus sibirica from Nertchensk! This last information came as a shock to me, for who would expect a plant from the Transbaikal territory to be tender in Central Russia? Nearly all plants from Manchuria also freeze in Kozlov, it isn't the wood that gets hurt, no, it is the young growth which gets caught by the late spring frosts and from which these Manchurian plants never recover.

Mr. Mijurin stated that Wladimir cherries are in little favor with Russian fruit growers, for they only do well in Wladimir and when tested in other regions, they decline in vigor and the fruits become smaller and ultimately the plants succmmb. If this is correct, we will have to develop types suited to various localites.

Then Mr. Mijurin has been hybridizing American blackberries with wild Russian forms and obtained some fine forms. And the same with American grapes and Caucasian, and he stated that he possesses a hybrid of Vitis vinifera, "Dendrelabi" x V. riparia, that possesses the hardiness of the last and has very large fruits. The state in which his garden was showed the observer that more work has been undertaken than profitably could be disposed of and in case some sudden accident should befall Mr. Mijurin most of the material would disappear without people knowing what it really was. Mr. Mijurin

invited me to come back in summer, as he had several interesting things yet that were covered up now and I think it would almost pay me to make an extra trip to see him."

SPECIAL NOTE.

Mr. Frank N. Meyer, our Agricultural Explorer, has just returned from Siberia after spending nearly two and one half years of considerable hardship in the field. His explorations have taken him through a region which resembles our great Northwest and while the plants which he has found and introduced may not be quite as novel as those which he brought back from his Chinese expedition, there is quite a good chance that some of them will prove perfectly hardy in the Northern States and be of greater interest to experimenters there than plants from the milder region of China.

It is expected that Mr. Meyer will be in this country for the season at least and will visit the collections of his plants which are now growing at various places.

His seeds and plants are now being propagated at our Plant Introduction Gardens and will be available for experimenters in the course of one or two years.

(Issued May 4, 1912.)

PRUNUS AVIUM. RUSSIAN CHERRY. S.P.I. No. 32674.

A large-fruited variety of cherry, of fresh sour-sweet flavor, originated in 1888 by the Russian plant-breeder, Mr. I. V. Mijurin, at Kozlov, Tambov government, central Russia, and named by him "Knyasnaia Sjevera" meaning "Queen of the North." Said to be a hybrid between an early Wladimir cherry and a variety of sweet cherry called "White Winkler." Has stood the severe winters of central Russia very well and may be expected to thrive in the greater part of the Middle West, and more especially in those sections where the climate is more or less semi-arid. See Plant Immigrant Bulletin No. 72 for further description. From photograph presented by Mr. Mijurin.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 74.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

March 1 to 31, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Aeschynomene	33119
Amygdalus	33215-221
Cacara	33258
Corylus	33234
Crataegus	33205
Diospyros	32901
	33069-070
	33086-088
	33203-204
Eugenia	33261
Ficus	33071
	33104
Gossypium	33089-090
Hedysarum	33073
Juglans	33180-181
Lecythis	33259
Lonicera	33053
Miscanthus	33191
Myrtus	33271
Olea	33225-226
Vitis	33074-076
	33111-118

PLATE: Lonicera maackii. Honeysuckle.

NEW PLANT IMMIGRANTS.

AESCHYNOMENE ELAPHROXYLON. (Fabaceae.) 33119. Seeds from Lawang, Java. Presented by Mr. M. Buysman. This tree from the Sudan grows in shallow water along the upper Nile, in the shallows of Lae Chad, and throughout Central Africa. The wood which grows so rapidly that the tree attains its full height of 25 feet in two years is very light, and has attracted the attention of the Lighthouse Service, at whose suggestion the seed was obtained. For distribution later.

AMYGDALUS COMMUNIS. (Amygdalaceae.) 33215-218. Plants of almond from Granada, Spain. Purchased from Mr. Pedro Giraud through Mr. Walter T. Swingle, of this Department. "Malagueña. This is the famous Jordan almond which is exported so largely from Malaga. I was told at the American consulate that some $800,000 worth of almonds had been exported from the port of Malaga alone during the year 1911. These exports consist largely of the Malagueña variety. Jordan almonds are classified by the wholesale dealers as to number per ounce. They run 15 to 30 or more per ounce. The English market takes the very large size, the American market taking most of the 30's and other small sizes. Out of 100,000 boxes only three or four hundred would be as large as 15 or 16 to the ounce. This is called the export variety by the cultivators around Malaga, after the Spanish word 'exportacion.' It is grown in very dry situations and is properly speaking a dryland crop of very great importance. Mr. Pedro Giraud, from whom the plants were secured, says of almonds in general that they give best results in calcareous, warm, dry, rocky, soils. Of No. 33218, 'Almendro del Desmayo,' Mr. Pedro Giraud says 'This is the most resistant to frost, which is caused by the peculiar attachment of the flower, which is turned downward, its corolla and sepals protecting it against the action of frost, in this way securing the fertility of this sort when all other varieties would have their crops destroyed.'" (Swingle.) For distribution later.

AMYGDALUS PERSICA. (Amygdalaceae.) 33219-221. Plants of peaches from Granada, Spain. Procured from Mr. Pedro Giraud through Mr. Walter T. Swingle, of this Department. "As to these three varieties of peaches no definite information was available but as the Spanish peaches are famous for their quality any variety which is propagated in Spain is likely to be of good quality." (Swingle.) For distribution later.

CACARA EROSA. (Fabaceae.) 33258. Seeds of the yam bean from Kingston, Jamica. Presented by Mr. William Harris,

Superintendent of Public Gardens. "The root is formed of a number of simple cord-like fibres, several feet in length, stretching under the surface of the ground, bearing in their course a succession of tubers. The beans are poisonous, but the root affords a very plentiful supply of very wholesome food. The produce of three plants is usually sufficient to fill a bushel basket. The tubers may either be boiled plain, in which state they are a very good substitute for yams and other roots in common use; or they may be submitted to a process similar to arrowroot, and a starch obtained. This starch is pure white, and is equal in every respect to arrowroot. To the taste it is very palatable, is easily digested, and is employed for custards and puddings. Even the trash left after obtaining the starch, and which in the preparation of arrowroot is lost, may, when thoroughly dried, be formed into a palatable and wholesome flour. A very excellent flour may also be obtained by slicing the tubers, drying them in the sun, and then reducing to a powder. This plant is deserving of being more generally cultivated than it has hitherto been. It ought in a great measure to supersede the arrowroot in cultivation. It can be planted at any season of the year, and the roots are fit for digging in the course of four or five months; the return is infinitely greater than that from arrowroot, and the proportion of starch also is more abundant, so that it can be brought to market at so cheap a rate, as to admit of being employed by the calico-printers in place of potato-starch. Dr. Trimen, pointed out that the pods when young are not poisonous, but may be eaten like French beans, being superior in the absence of any fibrous string along the sutures of the pod. The large size is also an advantage, as they are often 10 to 12 inches long. In Jamaica the seeds are generally sown in March or April, but they can be sown at any time. At Hope Gardens seeds were sown in September. The pods are ready for use as French beans 7 months after sowing and when pods are quite ripe, 9 months after sowing, the yams are fit to dig. From one seed sown at Hope Gardens 5 yams were dug weighing altogether 14 pounds. They generally vary in size from one foot to eighteen inches long, and 4 to 6 inches in diameter." (Harris, Bull. Bot. Dept. Jamaica, 44:4(1893). For distribution later.

CORYLUS AVELLANA. (Fagaceae.) 33234. Plants of hazel nut from Granada, Spain. Procured from Mr. Pedro Giraud, through Mr. Walter T. Swingle, of this Department. "Rouge ronde. Spain furnishes the bulk of the hazel nuts that enter into the world's commerce, whole regions being given up to this remunerative culture in the north of Spain. It is said to prefer rather light, cool soils and to grow well with more or

less shade. The trees are set at a short distance apart. The variety from its name would seem to be of French origin, meaning the 'round red.'" (Swingle.) For distribution later.

CRATAEGUS AZAROLUS. (Malaceae.) 33205. Plants of azarol from Granada, Spain. Procured from Mr. Pedro Giraud through Mr. Walter T. Swingle, of this Department. "Encarnado. The azarol represents a type of fruit whose cultivation has been much neglected in the United States. These fruits, which r ipen from Auust to October in Spain and France, are from a half inch to an inch in diameter or even more and have a delicious subacid flavor with flesh of a melting character. In flavor and texture its fruits resemble loquats in many respects. These plants are grafted on common hawthorn and are said to grow in all kinds of soil, both dryland and under irrigation. The variety in question is a flesh-colored one, supposed to be of Italian origin." (Swingle.) For distribution later.

DIOSPYROS SP. (Ebenaceae.) 32901. Cuttings of a persimmon from Algiers. Presented by Dr. L. Trabut. "Boufarik. A new variety, with very good, large, round, flattened, green fruits." (Trabut.) For distribution later.

DIOSPYROS KAKI. (Ebenaceae.) 33069-070, 33086-082, 33203-204. Cuttings of persimmons from Japan, mostly from branches bearing male flowers. These have been found necessary in order to supply adequate amounts of pollen, since most of the Japanese persimmons now growing in this country bear comparatively few male flowers. For distribution later.

EUGENIA SP. (Myrtaceae.) 33261. Seeds from Para, Brazil. Presented by Mr. Walter Fischer, late acting director, Campo de Cultura Experimental Paraense. "This is a small-sized tree about six inches in diameter and 20 feet high. The fruit is bright red like a wild goose plum and of the same size. The peel or rind is somewhat thick but edible like the soft juicy pulp that surrounds the one or two large hairy seeds; the flavor is slightly resinous and also suggestive of strawberries. It makes a good sauce when stewed and is also very good raw." (Fischer.) For distribution later.

FICUS MACROPHYLLA. (Moraceae.) 33071. Seeds of the Moreton Bay fig from Sydney, New South Wales. Presented by Mr. J. H. Maiden, Director, Sydney Botanic Garden. A remarkable shade tree from the coastal districts of Queensland and New South Wales, the leaves and fruit of which are an excellent stock food, while the trees will grow amongst rocks where

scarcely anything else will grow, and will stand being blown upon by fierce winds and being hacked back more than almost any other tree. With plenty of room it is one of the most beautiful of trees. Will probably be of value in the nearly frost-free regions of the Southwest, although it occurs as far south as 34° in New South Wales. Less suited for arid regions than the next which has about the same range. For distribution later.

FICUS RUBIGINOSA. (Moraceae.) 33104. Seeds of the Port Jackson fig from Sydney, New South Wales. Presented by Mr. J. H. Maiden, Director, Sydney Botanic Garden. Less ornamental than the preceding and better suited for dry regions than that tree. Probably like that only suited for regions w here frosts are rare. For distr ibution later.

GOSSYPIUM SPP. (Malvaceae.) 33089-090. Cotton seeds from Lake Tsana, Abyssinia. Presented by Mr. Guy R. Love, American vice consul general, Adis Ababa. "The cotton raised in Lake Tsana district is of a much superior quality, being of longer fiber and lighter in color." (Love.) For distribution later.

HEDYSARUM CORONARIUM. (Fabaceae.) 33073. Seeds of sulla from Jerez de la Frontera, Spain. Presented by Mr. Percival Gassett, American consul. This seed is from Jerez, referred to in a recent consular report as a region where a specially fine breed of horses are pastured entirely on the 'zulla', which is supposed to give them many of their admirable qualities. For distribution later.

JUGLANS REGIA. (Juglandaceae.) 36180-181. Walnuts from China. Presented by Mr. Samuel S. Knabenshue, American consul general, Tientsin. A hard-shelled and a soft-shelled variety, the former from the hills west of Peking, the latter from C hangli. For distribution later.

LECYTHIS USITATA. (Lecythidaceae.) 33259. Sapucaia nuts from Para, Brazil. Presented by Mr. Walter Fischer, late acting director, Campo de cultura experimental Paraense. "This is a large tree of the Monkey-pot family, native of forests in the region of the Amazon. It has large, urn-shaped fruits of a hard, woody texture, about 6 inches in diameter, with lids measuring about 2 inches across. When ripe the lid separates from the capsule, emitting a sharp sound, which when heard by the monkeys is a signal that the nuts are falling and a scramble and a fight to be the first to obtain them ensues; on this account few are left for the trader, and the export is consequently small. The common name of Monkey-pot is applied to the capsule when empty." (Smith's Dictionary of popular names of economic plants.) For distribution later.

LONICERA MAACKII. (Caprifoliaceae.) 33053. Seeds of a honeysuckle from the Royal Botanic Gardens, Kew. Presented by Dr. David Prain, Director. This honeysuckle from southern Manchuria and northern Japan promises to be hardy throughout the eastern United States. It has slender arching branches with nearly glabrous ovate-acuminate leaves,and dense clusters of creamy-white flowers. For distribution later. See half-tone.

MISCANTHUS JAPONICUS. (Poaceae.) 33191. Seed from Yokohama, Japan, Procured from the Yokohama Nursery company. "Miscanthus japonicus has been found in our experimental work to produce a light bulky paper in many respects similar to that made from esparto. The yield of fiber is up to the average of esparto, and there may be areas where the plants can be grown especially for paper making. It thrives on the poorer soils in this region and has been grown with some success even in Maine; the excessive winterkilling here, however, would prevent its becoming a successful crop plant." (Charles J. Brand, for whose paper-making experiments the seed was secured.) For distribution later.

MYRTUS ARAYAN. (Myrtaceae.) 33271. Seeds of the arayan from Rio Verde, San Luis Potosi, Mexico. Presented by Dr. Felix Foex, Director of the agricultural experiment station of Rio Verde. "These seeds are from a fruit tree of the state of Jalisco. This fruit is well appreciated by young boys, and above all, by young girls; but not by older people, because of the acidity. But they are delicious: 1st. Cooked with sugar. 2nd. Dried in powdered sugar. 3rd. In sauces for puddings, etc. 4th. In syrups. These fruits are very small, but when the young trees are 18 months old they can be budded with larger and better varieties." (Foex.) For distribution later.

OLEA EUROPAEA. (Oleaceae.) 33225. Plants of olive from Granada, Spain. Procured from Mr. Pedro Giraud, througn Mr. Walter T. Swingle, of this Department. "Gordal or Sevillana. This is the famous variety which yields the large green pickled olives so common in America. It is largely cultivated in the zone immediately about Seville, where its culture is said to succeed better than in any other part of Spain. They run from about 70 to 200 per kilo or about 30 to 90 to the pound. These enormous olives are of beautiful appearance, but by the Spaniards are not considered to be of as good quality as some of the other varieties, such as the Manzanillo. The Sevillana is graded very carefully, running 70, 80, 90, and 100 and so on per kilo, and this grading makes the olives for

the American market much more expensive than for the Argentine and other markets which do not require such an excessively high grading." (Swingle.) For distribution later.

VITIS VINIFERA. (Vitaceae.) 33074-076, 33111-118. Cuttings of grapes from Bhamdun, Mt. Lebanon, Syria. Presented by Rev. Alfred Ely Day. Eleven varieties of grapes of table, raisin and wine sorts. For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

CUBA. Central Soledad, Cienfuegos. Mr. Robert M. Grey, superintendent of the Harvard Botanial Experimental Station, writes April 23, 1912, "I have a variety of cane that is rich in sucrose but cannot be fertilized with its own pollen. This year I covered one of the panicles with gauze cloth and fertilized the flowers with quantities of pollen from Indian corn which resulted in my obtaining over seven hundred seedlings from one cane panicle thus treated. The plants are small yet and show no traces of corn and it is possible that the corn pollen simply acted as a stimulus to fertilization."

RUSSIA. Rostoff-on-Don. Mr Frank N. Meyer wrote Dec. 11, 1911: "I went to the newly established Selection Station at Saratov, where I saw Mr. A. J. Stebut, who is in charge. This Station was started only some months ago, so the buildings even were not finished and the grounds were not laid out. Mr. Stebut told me of their plans. And here are his main remarks. Southern Russia derives her greatest income from the durum wheats, therefore this selection station will devote the major part of both time and money to the study of these wheats, the aim being to select types better suited to drouth than the present varieties: to create good winter durum wheats, if possible; to hybridize durum wheats with other wheats, so as to develop new races; to study "Poltavka", a soft wheat; to try to develop strains of sunflowers, resistant to the ravages of Orobanche, which is a pest in Southern Russia (one variety of sunflower called "Selonka" seems much more resistant than other varieties and will be taken as a starting point);to study all the local varieties of wheats, as there are several existant, which are grown in limited localities only and have escaped the attention of describers; to investigate the reasons why durum wheat degenerates so seriously, when sown on soil which grew wheat before; to create new races of forage plants, better suited to local conditions than alfalfa or red clover, cooperating in this line with Mr. W. S. Bogdan, at Krassny Koot. Later on they would also start the

investigations of fruits and develop varieties better suited to the South Russian climate. Mr. Stebut stated that although the Svalöf wheats are absolute failures in Southern Russia, the oats are successes, especially "Whiteling" and "Ligowo"; that the name "Kherson oats" is American, that a variety so named is not known in Russia, but that these same oats, re-imported from American, are proving a great success in Saratoff Government; that Russia is realizing at last that agriculture is the basis of all prosperity and that it is today spending more than ten times the amount of money upon agricultural investigations that it did four or five years ago; that America is taken as a model for all this new work; that the Russian people appreciate their own products better after they have been re-imported from America than they do when picking them out themselves; that Mr. Bogdan at Krassny Koot is doing a noble work; that he has given to the world two new fodder plants, Triticum cristatum and Medicago falcata, both true Russian products; that Russia has long been dormant but that the world may expect yet many new things from her in the agricultural line.

Mr. Stebut is much interested in obtaining from us samples of various wheats and literature on wheats and cereals in general. Then he wants to exchange with us later on local wheats for American wheats. Mr. Stebut has studied in Vienna and at various places in Germany; has visited Dr. Nilsson at Svalöf, in Sweden, and Prof. Johansen in Denmark, and is of good scientific training in general. He also told me, as an example of what a monetary loss may result when the wrong sorts of grain are imported, that several years ago the beer of Samara was famous for its good qualities. Now, however, it has become quite bad, simply on account of a serious drouth which ruined the barley crops and which made the farmers import barleys from the Caucasus, which were absolutely unfit for beer production. The results are that the breweries of Samara are being closed one after the other and beer is imported from places where there is apparently still good brewing barley to be had. I also heard that the mills in Russia pay extra salaries to those men who thoroughly understand how to mix the largest quantities of flour from soft wheats with durum wheat flour, as the last flour is the more expensive in Russia.

The country around Sarepta is very interesting. The level land stretching down to the Wolga, suddenly rises up in a tableland and this land is cut up by numerous gullies and ravines. Some of these ravines are covered with a dense growth of Acer tataricum, some are full of Ulmus suberosa and others have groves of wild apples as inhabitants, while small scrub of Spiraea hypericifolia is seen on the higher edges.

In a broad valley I passed a dense wood of Quercus pedunculata, while on the edges there was a dense growth of wild sloughs (Prunus spinosa), Euonymus verrucosa, Crataegus sanguinea, Rhamnus cathartica and some minor things.

I noticed that Cytisus biflorus is a great sand-binder, making roots of truly enormous length; the sheep and goats, which graze in large numbers on the hills, leave it severely alone, so I suppose it must be rather poisonous. There is a good lot of Ephedra vulgaris to be seen of which the Russians make use as a blood purifying remedy. On some hill slopes I noticed clumps of Triticum cristatum growing in pure sand and it appears to me, that this grass has also a future before it in the drier sections of America."

PLANTS FOR DISTRIBUTION, May, 1912

Acacia cornuta	33652
Ambelania tenuiflora	27577
Ananas sativus	29211
Atalantia glauca	29660
Bambos arundinacea	32761
Castilla sp.	31225,31360
Clerodendrum dichotomum	31706
Coffea dewevrii	31758
Dipterocarpus alatus	23343
Dipterocarpus intricatus	23344
Dymocarpus longan	
Elaeodendron orientale	29020
Ficus utilis	29359
Glycosmis pentaphylla	24609
Gustavia sp.	27851
Inga edulis	27798,29013
Jatropha sp.	25775
Lansium domesticum	24431
Machilus nanmu	29485
Mangifera zeylanica	31633
Psidium guajava	30476-477,31359
Quillaja saponaria	26325
Ravenala madagascariensis	29424
Rheedia edulis	30492
Rheedia macrophylla	27578
Rosa, Belle Portuguoise	29729
Rosa hybrid	32668
Spathodea campanulata	31953
Vangueria madagascariensis	29021

LONICERA MAACKII. HONEYSUCKLE. S. P. I. No. 33053.

A beautiful rapid-growing flowering shrub, attaining a height of 10 feet, with spreading branches, ovate-elliptic leaves, in the axils of which are borne clusters of trumpet-shaped flowers, white on first opening, rapidly turning yellow.

(Issued June 4, 1912.)

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 75.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

April 1 to 30, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Offfice. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show hat they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduotion is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Agave	33508	Pinus	33466
Ammophila	33320	Pistacia	33441
Amygdalus	33311-312	Ricinus	33408-417
Arracacia	33467-468	Roscheria	33347
Cucurbita	33511	Rubus	33342-345
Dioscorea	33350	Solanum	33471-491
Hedysarum	33303-307	Spinacia	33308
Jasminum	33500	Trigonella	33295-302
Larix	33317-319	Triticum	33285-288, 33423
Lathyrus	33290		
Lilium	33310	Vitis	33376-378
Onobrychis	33291-294	Zea	33348-457

PLATE: Arracacia xanthorrhiza. Arracacha.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

AGAVE CANTULA. (Amaryllidaceae.) 33508. From Manila. Presented by Mr. M. M. Saleeby, fiber expert, Philippine Bureau of Agriculture, through Mr. L. H. Dewey of this Bureau. "Manila maguey is cultivated in the Philippines and to a limited extent in India, where it produces the fiber known as Bombay aloe. It is cultivated on a large scale in Java, producing a very excellent quality of fiber which has heretofore been placed on the market under the misleading name 'Java sisal'. The Javanese growers now propose that this fiber shall be called 'cantala'. It grows well in Java on rich loamy soils, where the heavy rainfall and lack of lime make it impossible to cultivate sisal or henequen to good advantage. This plant would grow well in the eastern part of Porto Rico." (Dewey.) For distribution later.

AMMOPHILA SP. (Poaceae.) 33320. Seed of a grass from St. Petersburg, Russia. "A perennial, tall grass, found growing in sand-dunes in northern Mongolia. Its seeds are collected by the Mongols and a coarse bread made from them. This grass seems to possess excellent sand-binding qualities and might be tested for this purpose in cold and dry sections of the United States. Obtained from Mr. J. W. Palibin, St. Petersburg Botanic Garden, who received these seeds from the neighborhood of Lake Ubsa, northwestern Mongolia." (Meyer's introduction.) For distribution later.

AMYGDALUS SPP. (Amygdalaceae.) 33311-312. Seeds of wild almonds, from St. Petersburg Botanic Garden. "Wild almonds occurring in the hot and dry mountain regions of Russian Turkestan. May be experimented with for the following purposes: as a drough resistant stock for almonds and peaches; as a possible drough resistant nut tree; as an ornamental small tree in desert regions and as a hybridization factor. The second may also prove of value as a hedge material for desert regions." (Meyer's introductions.) For distribution later.

ARRACACIA SPP. (Apiaceae.) 33467-468. Tubers of arracacia from La Guaira, Venezuela. Procured by Mr. Thomas W. Voetter, America consul. "Apio. It is known by this name in Caracas, and it is much appreciated for use in chicken or beef soups. It is produced in the heights of the mountains from 5000 feet upwards at a temperature of 20° C. (68° F.). The method of sowing it here is the ordinary way. The workman makes a hill of earth a half a yard high and two yards in diameter, well pulverized, and the seed is sown. Or the cutting which comes from the trunk or head of the plant is cut

with care, leaving on each cutting about a quarter of an inch of the fleshy part of the root and two or three inches of the top. This fleshy part is set two inches deep in the top of the hill and is always kept free from weeds. Hilling is done after the plant has eight to twelve sprouts, taking care not to heap the earth against the trunks of the plant, which would seriously damage it. The plant can be pulled up when it is from 12 to 16 months old; some harvest it at from 8 to 10 months, but it is growing up to 13 to 14 months. Leaving it without pulling it up for 16 to 18 months or longer, it is very probable that it will be spoiled in color, flavor or tenderness, without being able to regain these qualities. The plants after being pulled up last but a short time after being pulled from the trunk." (Casañas, in report by Mr. Thomas W. Voetter.) For distribution later.

CUCURBITA SP. (Cucurbitaceae.) 33511. Seeds of a squash from Puerto Allegro, Brazil. Presented by Mr. Willy Muller, Hortus Nucerensis, Nocera Inferiore, Naples, Italy. "'Mogango.' A very fine squash which I hope will be useful, especially for Florida, Texas, and Southern California." (Muller.) For distribution later.

DIOSCOREA SP. (Dioscoreaceae.) 33350. Tuber from Livingston, Guatemala. Presented by Miss Lucie Potts. "This is called the potato of the air (papa del aigre). The natives say it was the original potato. It grows on a vine and is produced above ground, and when boiled tastes very much like a potato." (Potts.) For distribution later.

HEDYSARUM SPP. (Fabaceae.) 33303-307. Seeds from St. Petersburg, Russia. "Perennial legumes, which may be tested fr their possible forage value." (Meyer's introductions.) For distribution later.

JASMINUM SP. (Oleaceae.) 33500. Plants of a jasmine from Enfield, England. Presented by Mr. Amos Perry. "A Chinese novelty. The only red jasmine yet known. It is a quick grower, quite hardy. Flowers very abundant, of a bright, deep cherry red." (Perry.) For distribution later.

LARIX SIBIRICA. (Pinaceae.) 33317-318. From St. Petersburg, Russia. "The little known Siberian larch, an excellent lumber tree, requiring only a very short season to mature; 10 weeks of summer apparently being sufficient to complete the whole process of coming into leaf and shedding again. This tree possesses also great value as an ornamental park tree in cool, uncongenial climes, like in and around St. Petersburg,

where it becomes one of the tallest of all trees. Can also be clipped into pyramids to serve in formal gardens and along walks. May be expected to thrive especially in the cool and moist sections of the United States." (Meyer's introduction.) For distribution lter. For illustration see Bulletin No. 72 this series.

LARIX SP. (Pinaceae.) 33319. Seeds of a larch from Estate Mitino, Torchok, Twer government, Russia. "A larch, occurring in Manchuria, eastern Siberia, northern Korea, etc., forming here and there large forests. Its lumber is also of excellent quality, though apparently not ranked as high as that of Larix sibirica. It is also a fine ornamental tree, not growing as tall as L. sibirica, but better able to withstand drought and heat. Can also be clipped and pruned for use in formal gardens and seems naturally to branch out nearer the ground, than L. sibirica. Received from Mr. D. D. Romanoff, on whose estate it grew." (Meyer's introduction.) For distribution later.

LATHYRUS SP. (Fabaceae.) 33290. Seeds of a Lathyrus from St. Petersburg Botanic Garden. "A rare, perennial Lathyrus, which occurs here and there on mountain slopes in southern Bokhara, having large reddish-pink flowers, which are quite fragrant. Of value as a factor in hybridization experiments in trying to create perennial sweet peas, and as a possible forage plant for dry, hot regions." (Meyer's introduction.) For distribution later.

LILIUM DAHURICUM. (Liliaceae.) 33310. Seeds of a lily from St. Petersburg Botanic Garden. "A lily, coming from the Amur region, having bright brick-red flowers. Though not of large dimensions, this plant seems a desirable acquisition to the hardy border." (Meyer's introduction.) For distribution later.

ONOBRYCHIS SPP. (Fabaceae.) 33291-294. Seeds from St. Petersburg, Russia. "Annual legumes, which may be tested for their possible forage value." (Meyer's introductions.) For distribution later.

PINUS LEUCODERMIS. (Pinaceae.) 3346. Seeds of pine from Sophia, Bulgaria. Presented by Mr. K. Baicoucheff, Chief inspector of Waters and Forests of Bulgaria, at the request of Mr. Alaricus Delmard. "A tree reaching a height of 80 feet, with pyramidal head. Bark light gray; leaves dark green 2 to 4 inches long. This tree is related to P. laricio, and by some authorities referred to as var. austriaca of that species.

In Great Britain, according to Veitch's Manual, it is usually a smaller tree than P. laricio proper and of denser habit, with stout and long horizontal branches and shorter but stouter and more rigid leaves of a darker green. It is said to be a fast growing tree of great accommodative power on the poorer classes of soils for bearing shade; it is one of the best kinds for forming shelter screens. The wood is coarser in grain than that of P. laricio and is apt to be knotty when the trees have been grown in poor soils." (Beissner, Nadelholzkunde.) For distribution later.

PISTACIA VERA. (Anacardiaceae.) 33441. Cuttings of the pistache from Bronte, Itly. Presented by Mr. Charles Beek, gardener to the Duke of Bronte. An interesting shipment because of the various forms of packing used. Some cuttings were packed with their ends wrapped in clay and then in cloth, others with the ends waxed, others with moss and oiled paper, and a lot in a tin tube with both ends packed in clay. Of these the propagator says; "There is such a slight difference in the condition of the 3 bundles of these scions that it is hard to say which is best, as all are in good condition except the tin tube lot. I really think the ones that had their ends covered with stiff clay are the best, the ones with the ends waxed came next, then the moss and oiled paper lot. The tin tube lot is in poor condition, all cuttings being mouldy and decayed on both ends." For distribution later.

RICINUS COMMUNIS. (Euphorbiaceae.) 33408-417. Seeds of castor bean from British India. Presented by Mr. John D. Shanahan, late of this Bureau, who procured them at the Allahabad exhibition. "There is one feature about the castor bean which all the evidence the writer could collect seems to bear out, and that is that the smaller bean is very much more desirable for commercial use than the larger one, as it is generally given credit for producing a larger yield and better quality oil. This of course is only in a general way. In India where the greater part of the commercial bean is obtained, the product grown in the territory surrounding Cawnpore is usually very large and in commercial contracts this bean is barred on account of its large size and insignificant yield of oil. The castor plant grows very large in some sections, reaching a height of from 25 to 30 feet, and in India it is mostly grown as a hedge plant, surrounding fields and dooryards. The manufacture of castor oil is growing in this country and it seems to the writer that the production of beans in this country should be encouraged." (Shanahan.) For distribution later.

ROSCHERIA MELANOCHOETES. (Phoenicaceae.) 33347. From Port Louis, Mauritius. Presented by Mr. G. Regnard. "A palm 15 to 24 feet high with many aerial roots and a stem 2 to 3 inches in diameter with a ring of spines when young below each leaf-scar. Very ornamental and becoming scarce." (Regnard.) For distribution later.

RUBUS SPP. (Rosaceae.) 33342-345. Seeds of Rubi from Ootacamund, India. Presented by Mr. F. H. Butcher, curator, Government Botanic Gardens. Four species of Rubus introduced for breeding purposes and comparative tests. Several of the southern Indian species of this genus have edible fruits of good quality comparing with the best American species. For distribution later.

SOLANUM TUBEROSUM. (Solanaceae.) 33471-491. Tubers of potato from Kenty, Galicia, Austria. Purchased from Messrs. Heinrich Dolkowski and son. Twenty-two varieties representing the best potatoes grown in Austria. For distribution later.

SPINACIA TETRANDRA. (Chenopodiaceae.) 23308. Seeds of a wild spinach from St. Petersburg Botanic Garden, St. Petersburg, Russia. "A wild spinach, occurring in central Asia. Of value possibly in hybridization and selection experiments, with the object in mind of creating strains of spinach more resistant to hot weather and less quickly shooting into seed than present varieties do." (Meyer's introduction.) For distribution later.

TRIGONELLA SPP. (Fabaceae.) 33295-301. Seeds from St. Petersburg, Russia. "Annual legumes, which may be tested for their possible forage value." (Meyer's introductions.) For distribution later.

TRITICUM AESTIVUM. (Poaceae.) 33523. Seed of wheat from Tashkent, Russian Turkestan. Presented by Dr. Richard Schroeder, Director, Agricultural experiment station. "Our best Turkestan wheat, 'Ssarymaguis,' that is, 'yellow grain.' This variety belongs to the species T.aestivum, but under dry conditions gives hard kernels. It is a spring wheat, but in Turkestan it is often sown late in the fall and sprouts in the beginning or at the end of the winter. We get the bulk of our annual rainfall in winter and spring, and as our summer and fall are too dry for sprouting of wheat in September or October (sometimes even in November), this fall sowing is equivalent to early spring sowing and is largely practiced with spring wheats. True fall wheat is sown with us mostly on irrigated lands. The sample I send is taken from a farmer, one of our

neighbors (District of Tashkent.) It is not pure and contains some other varieties mixed with the 'Ssarymaguis.'" (Schroeder). For distribution later.

TRITICUM DURUM. (Poaceae.) 33285-288. Seeds of summer wheats from St. Petersburg, Russia. Four varieties of summer wheats, some grown under irrigation, some without, all from the hot and dry Syr-Daria district of Russian Turkestan. (Meyer's introductions.) For distribution later.

VITIS VINIFERA. (Vitaceae.) 33376-378. Cuttings of grapes from Almeria, Spain. Procured by Mr. James Murison, acting consular agent, at the request of Mr. Walter T. Swingle. "Uva de Embarque, (white grape)", "Uva de Casta (Melinera variety)", and "Uva de Casta (Rosada variety)". For distribution later.

ZEA MAYS. (Poaceae.) 33448-457. Seeds of maize from La Paz, Bolivia. Presented by Mr. Horace G. Knowles, American minister. "Cuzco corn. The grains of this corn are twice the size of the largest I ever saw in the United States, and its snow-white color and fine flavor make it superior to our American white corn. Another and very important advantage that it has over our American corn is that it produces on the same number and length of ears from 10 to 30 per cent more corn. Thus its increased yield would be about one quarter more than the average of the American variety of corn in the United States, and if it will grow as well there as here, and my belief is that it will produce even better there than here, it would have an enormous effect on the total corn production of our country. Another great advantage it has is that it thrives in a climate similar to that of our northern states, and it may be that it can be grown in sections of our country that will not produce our American varieties. Another feature of this corn is its very fine texture. I believe it would grind as fine as wheat flour, and as corn flour it would be far superior to meal in many respects and for many uses it would be equal to wheat flour." (Knowles.) Included in this lot are white, variegated red, white and black, black corns, and variegated red sweet corn , and a white sweet corn, of which Mr. Knowles says, "A sweet or sugar corn which is so very sweet that sugar or syrup could be made from it." For distribution later.

ARRACACIA XANTHORRHIZA. Arracacha.

A native of the mountains of South America at heights above 4000 feet, and cultivated at lower altitudes. It is a member of the celery family, which plant it resembles, and has large fleshy yellow roots, which when boiled are very palatable resembling parsnips in flavor. It is the staple food of Venezuelans and Colombians living at high altitudes. As the plant requires 12 to 16 months to develop it will probably grow only in comparatively frost-free regions. Should be planted in hills 18 inches high and two yards across, using a cutting of about a quarter inch of the fleshy part of the root and several inches of the top. When eight to twelve sprouts appear the hilling may be done, taking care not to heap the earth against the shoots.

(Issued June 18, 1912.)

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 77.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

June 1 to 30, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Ampelodesma	33750	Chenopodium	33742
Andropogon	33786	Chrysobalanus	33791
	33787	Citrus	33761
Annona	33745-748		33788
Asparagus	33721-735	Cocos	33762
	33780	Hibiscus	33749
Cassia	33782	Malpighia	33740
Castilla	33743-744	Olea	33783
	33784	Rubus	33793

PLATE: Rollinia orthopetala.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

AMPELODESMA TENAX. (Poaceae.) 33750. Seeds of diss from Algiers, Algeria. Presented by Dr. L. Trabut. This plant which is often confused with the esparto, Stipa tenacissima, grows wild on the Algerian coast, and is said to produce 84 per cent of fiber, with an average length of five feet. This fiber has been used for nets for fishing, which are very durable if kept in water and protected from the sun. It has also been imported into Sicily for paper making and has been made into rope in Italy. (After Dodge, Useful fiber plants.) For distribution later.

ANNONA SPP. (Annonaceae.) 33745-748. Seeds of anonas from Guadalajara, Mexico. Presented by Mr. Samuel E. Magill, American consul. "There are four varieties of annonaceous fruits grown in this part of Mexico probably originating from the same stock but now having essential differences due to the changes made in time by different altitudes and temperatures. The names of these four varieties are chirimoya (A. chirimola), ilama (A. diversifolia), anona (A. reticulata) and cabeza negra (A. purpurea). The chirimoya is one of the best fruits grown in the 'tierra templada' or temperate region. When grown under the best conditions it is undoubtedly the best of the family. Color brownish-green, with dark brown or black seed, and pulp white, tender and very sweet. The ilama also grows best in a temperate climate although that grown at Colima and further south is very fine, but the variety grown on the sides of the Colima volcano and Cerro Grande, at an altitude much above the level of the surrounding country, is much better. The color of the ilama is green-gray when ripe with seeds of a light coffee color. The pulp is brownish-white and firm and it breaks open when ripe. The ilama matures in October and November. The anona is strictly a tropical fruit and grows on the 'tierra caliente' or hot coast lands. There are two kinds of fruit called anona, the only apparent difference being in outside color when ripe, one being a yellowish-red and the other a greenish-gray. Each has soft white pulp, and black or dark brown seed. It ripens in April or May. I am told there is also a wild variety known as the cabeza negra or blac head. It is also known as 'frioy calentura' meaning 'cold and hot', or 'chills and fever,' due perhaps to its effect on one eating it, hence it is not popular and is rarely seen in the markets. It is difficult to get the truth as to the varieties of this fruit from the Indians or even from intelligent whites so much depending on the altitude or climate where the fruit is grown.

For instance, Mr. Bert Lindeman of Colima writes me from that place that the anona is a 'strictly tropical fruit from the hot coast', whereas on the market now in temperate Guadalajara one can buy locally grown fruits called 'anonas' which differ from the later ripening chirimoyas only in the outside color. The chirimoya should grow well in our southern states as it is hardy and developes best in the state of Guanajuato, Mexico, where it is rarely very hot or very cold but where frost is not uncommon." (Magill.) For distribution later.

ASPARAGUS SPP. (Convallariaceae.) 33721-735. Seeds and plants of fifteen species of asparagus from Kew, England. Presented by Mr. Arthur W. Hill, Royal Botanic Gardens. Introduced to complete as far as possible the collection of the species of this genus, grown for comparative tests and breeding work. For distribution later.

ASPARAGUS ALBUS. (Convallariaceae.) 33780. Seeds of an asparagus from near Byamor, Tenerife. Presented by Dr. George V. Perez, Puerto Orotava. A Canary Island species introduced for the same purposes as the preceding. For distribution later.

CASSIA FISTULA. (Mimosaceae.) 33782. Seeds of the "Canafistula" from Cuba. Presented by Mr. Robert L. Luaces, Camaguey, Cuba. "The 'Cauandonga' tree. The fruits are much used through the province of Oriente (Santiago de Cuba) as food and for making of something like chocolate. The smell of the fruit is bad, very bad, but the taste is not. The tree is pretty and could be grown as a shade tree in the south and some application may be found for the fruit. I do not know the botanical name and only that it is called in other parts of the island 'Canafistula.'" (Luaces.) "The 'Canafistula' is a small wing-leaved tree of the bean family, producing abundance of yellow flowers, a native of the East Indies and now common in most tropical countries. It produces a smooth cylindrical pod twice the thickness of the finger and sometimes two feet in length. The interior is divided into numerous transverse portions, each containing a seed embedded in pulp of a sweet taste, which forms an important laxative medicine. The leaves are used as a cure for ringworm." (Smith, Dictionary of Popular Names of Economic Plants.) For distribution later.

CASTILLA SPP. (Urticaceae.) 33743-744, 33784. Seeds of Central American rubbers from Guatemala and Costa Rica. Presented by Mr. Edward Reed, American consular agent, Livingston, Guatemala, and Mr. Carlos Werckle, National Museum, San Jose, Costa Rica, respectively. Introduced for the work of the

Bureau in bringing together all the promising rubber-producing plants for comparative tests and study. For distribution later.

CHENOPODIUM SP. (Chenopodiaceae.) 33742. Seeds from San Jose, Costa Rica. Presented by Mr. Carlos Werckle, National Museum. "'Apasote.' Used for seasoning like thyme, and especially good for shelled beans." (Werckle.) For distribution later.

CHRYSOBALANUS ICACO. (Rosaceae.) 33791. Seeds of the icaco from San Jose, Costa Rica. Presented by Mr. Carlos Werckle, National Museum, San Jose. "A much improved superior variety. Black." (Werckle.) This tree which is a native of Tropical America bears small pulpy fruits the size and shape of a plum, somewhat sweet, but with a harsh flavor peculiarly their own, which are much used for preserves and also as dessert fruit. For distribution later.

CITRUS SP. (Rutaceae.) 33761. Seeds of a lemon from Malta. Presented by Mr. James Oliver Laing, American consul. Obtained through the kindness of the secretary of the Malta Horticultural Society. "This new fruit is the result of experiments undertaken by the government expert here in the Gardens of San Antonio and is called the San Antonio lemon. The specimen sent and the lemon from which the seeds were taken were chosen as exhibition fruit to be shown at the yearly fair of the Malta Horticultural Society and are therefore not only a new variety but the best specimens of it. The fruit was labeled as follows at the fair: 'A seedling from a flat shaped variety at San Antonio gardens and exhibited now for the first time.' " (Laing.) For distribution later.

CITRUS SP. (Rutaceae.) 33788. Seeds of an orange from the Atlas Mountains, Algeria. Presented by Dr. L. Trabut, Algiers. "A late orange from Atlas Mountains, cultivated in the mountain valleys and grown from seed by the natives. Fruit excellent." (Trabut.) For distribution later.

COCOS SP. (Phoenicaceae.) 33762. Seeds from Haedo, a suburb of Buenos Aires, Argentine. Presented by Mr. C. F. Mead. "Found in southern Brazil, Paraguay and northern Argentina, but these seeds are from a tree grown by Vicente Peluffo & Co., at their proving grounds near Haedo, which speaks well for its frost-resisting qualities. This coco grows to a height of about 5 meters and is very similar in looks and fruit to the date palm. Fruit in looks is similar to a small crab apple except that it lacks lustre; it is comestible and tastes something like a green pineapple." (Mead.) For distribution later.

ANDROPOGON CITRATUM. (Poaceae.) 33786. Roots of an oil-grass from Trivandrum, Travancore, southern India. Presented by Mr. N. Kunjan Pillai, Director of Agriculture, Travancore. "A grass yielding oil in a fairly large quantity. It is locally known as Sambarapulla, (being used for flavoring butter-milk). This grass is more common in Ceylon and along the East coast. In the interior of Travancore it does not occur in abundance. There is reason to believe that the grass came from Ceylon because near Cape Comorin and up to a place called Arakkanikulam the grass occurs in abundance. Another peculiarity is that while I have never seen this grass in flower in Ceylon either under cultivation or in a native condition, it flowers freely amidst the boulders of Arakkanikulam on either side of the main road and also near the cape in Marathuvamala. This I think is due to its transport into a hotter locality. The boulders get heated and the grass lying between gets 'forced' as plants are in hot houses in other countries. When I saw the grass last time it was getting a disease corresponding to the black rust of cholam (maize). The pest was just beginning. The plants which I have selected are free. This grass is mixed with other Andropogons and distilled. The industry is in the hands of the uneducated and no sorting of varieties is done, because knowledge is absent." (Pillai.) For distribution later.

ANDROPOGON NARDUS. (Poaceae.) 33787. Roots of an oil-grass from Trivandrum, Travancore, southern India. Presented by Mr.N. Kunjan Pillai, Director of Agriculture, Travancore. "A grass very common all over Travancore, except at great elevations and very near the sea coast. In soft alluvial loam and under careful cultivation this grass grows to a height of 6 or 8 feet. This grass can be very easily identified by a light magenta tinge from the bottom upwards. The spikes are short and the leaves are narrow. It is locally known as chukku-naripullu, (grass smelling like Zinziber officinale). In Travancore I do not know of many places where this grass is taken up for cultivation. Grass is collected from the jungle by women getting between 4 and 5 chuckrums (2-3 annas) a day and by men getting 7 chuckrums (4 annas) a day. A monster vessel of copper is installed as a 'primitive' vat. In one day, one and a half bottles of oil could be distilled. The prices vary from Rs. three to Rs. six for a bottle of 24 ounces. One Mr. A. F. Sanderson, the then Deputy Conservator of Forests, and Mr. Miller, a manager of the Vellanad plumbago mines, made an attempt to open an estate of oil grass. They went on for sometime unmindful of outside talk, and collected a fair quantity of oil, but the business was dropped because it was taken up

only as a side industry. Other beginnings were made which were but short-lived. One cwt. of leaves is said to yield about 3 ounces of oil. The pure oil is thin, colorless and strong with a citron-like flavor. The average exportation of citronella from Colombo is about 40,000 pounds valued at 8,000 pounds sterling or about 4 shillings and 1 penny per pound. It is largely used to give the peculiar odor to what is known as 'honey soap' and in the making of perfumes. In Travancore propagation of this grass is left to nature, no care of any kind whatever being given. It is treated purely as a natural product of the jungle. It is even looked down upon as a glutton upon soil-food, deserving if possible extermination and cremation. In Ceylon the citronella grass is raised from seed and planted like Guinea grass, and will give two or three crops a year. When fit to cut the grass is carried to a large boiler and the oil is distilled. It is estimated to give about 3 dozen bottles to the acre, but the demand is limited and the price fluctuates from 2 shillings and 6 pence a bottle to 4 shillings and 6 pence a bottle. At the latter price it pays handsomely while at the former it little more than covers expenditure. A still capable of turning out a dozen bottles a day costs 300 pounds. A decoction of the leaves is used it is said to purify blood. It is also given in cases of cough and used in steam baths for colds. Externally it is applied to remove rheumatic pains in which case it is said to equal the Samadera indica of the sandy regions of northern Travancore. The oil is said to be good for cholera. For children it is a good tonic. It is also a stimulant and diaphoretic." (Pillai.) For distribution later.

HIBISCUS ESCULENTUS. (Malvaceae.) 33749. Seeds of okra from Avery Island, La. Presented by Mr. E. A. McIlhenny. "These seed are a variety of okra a friend of ours sent us from Egypt six or seven years ago. By careful selection we have produced a variety of okra which is unexcelled for table purposes. It is an early bearer, and has a thicker flesh and is more tender than any of the commercial okra which we have tried." (McIlhenny.) For distribution later.

MALPIGHIA COSTARICENSIS. (Malpighiaceae.) 33740. Cuttings from San Jose, Costa Rica. Presented by Mr. Carlos Werckle, National Museum, San Jose. "A small tree with large pubescent leaves; prolific, bearing very good fruit. Grows from cuttings, but root cuttings are said to be best." (Werckle.) For distribution later.

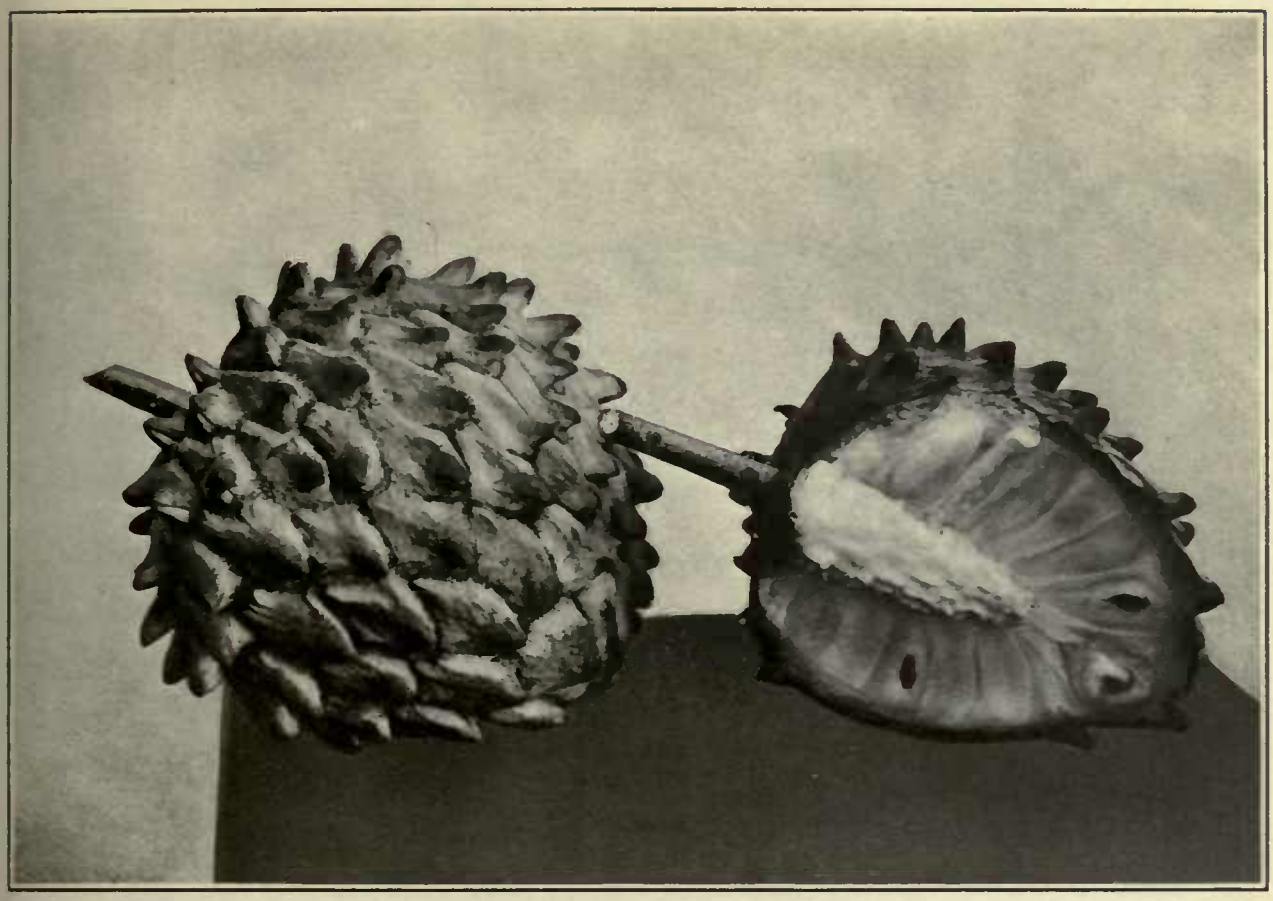
OLEA FOVEOLATA. (Oleaceae.) 33783. Seeds of bastard ironwood from East London, Cape Colony. Presented by Mr.

Charles P. Lounsbury, chief of the Division of Entomology of the Department of Agriculture of the Union of South Africa. A hard-wooded tree 30-40 feet in height, with glossy leaves and elliptical purple fruit ½ inch long, nearly dry, with a large one-seeded stone. Introduced as a possible hardy stock for the olive. For distribution later.

RUBUS MACRAEI. (Rosaceae.) 33793. Seeds of the akala from the Kau district, Hawaii. Presented by Mr. Ralph S. Hosmer, Superintendent of Forestry. "The native raspberry, akala. This species is quite generally distributed through this Territory between the elevations of 3500 and 5000 feet. It is a tall growing shrub, the canes frequently reaching a height of 12 to 15, or more feet. The fruit is large, from an inch to an inch and a half in length and about an inch in diameter. The flavor is rather sharp, but to me a pleasant acid. It has always seemed to me that this raspberry might with advantage be crossed with some cultivated variety." (Hosmer.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

ARGENTINA. SANTA CRUZ. Mr. Henry L. Regnard, Estancia Canadon de las Vegas, writes April 30, 1912: "This place is just about 50° 30' South on the Atlantic Coast with a very clear dry air, rainfall from 3 to 9 inches and strong gales of cold wind of frequent occurrence. I have two kinds of willows which grow fairly well, two kinds of poplars which also grow, a few ash trees making a brave struggle, oak the same, some horse chestnuts which remain dwarfed and starved looking, some sycamore struggling ahead, privets, laburnums, cherries, black currants rather luxuriant, red and white currants, raspberries dwarfed, dog roses, a pink rambler and some briars and brambles. Larch I cannot get to grow and out of very many maritime and Scotch pines planted I have only one left alive; it is some eight years old and about 3 ft. 6 in. high. I grow thick willow hedges and plant under thin shelter. Turnips, marigolds, cabbages, carrots, onions, potatoes, parsnips, salsify grow moderately well, broad beans form many pods but very few of the pods have beans in them, peas do fairly well. I have got a little white clover to grow, a few little patches of red clover; some alfalfa, rye, and oats do fairly well. Wheat and barley I have ripened, the oats and rye I cut a little before they are ripe for fodder. One great difficulty I have to contend with is the reversal of the seasons which tries all plants very much. Plants from Chile or the River Plate do not seem to have the capacity of resisting this climate. I think the winds are what check vegetation more even than the dryness of the climate. Gales last not infrequently 3 4, & 5 days. In spite of all I got two cuttings, light ones it is true, from my, alfalfa."



ROLLINIA ORTHOPETALA.

Rollinia orthopetala A.DC.(S.P.I.Nos. 22512,27579,27609) is one of the finest of all the custard apples. It probably ranks with the best chirimoya. The tree grows to a moderate size (30 to 40 feet) and has the habit of an Annona, with two-ranked entire leaves somewhat like those of A. reticulata. The greenish yellow fruit is prominently tuberculate or squamose, and about 6 inches in diameter. The seeds, which are very much like those of an Annona, are surrounded by a pleasantly flavored sweet-acidulous pulp, of a custard-like consistency. The species is very closely related to Rollinia mucosa of the West Indies, but is better flavored. It appears to thrive in low tropical situations which may be subject to periodical floods, and in such locations where the chirimoya (A. cherimola Miller) of subtropical regions does not fruit well, the Rollinia can be successfully grown. It is known in Brazil as Araticu. (After Safford.) From photograph by Mr. Walter Fischer, Para, Brazil, 2/5 natural size.

(Issued July 20, 1912.)

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 79.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

July 16 to August 15, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Amygdalus	34131	Eriobotrya	34119	Medicago	34147-51
Ananas	34124	Gardenia	34167	Omphalea	34156
Antidesma	34163	Gossypium	34184-194	Oryza	34220-49
Asparagus	34133	Grewia	34181	Persea	34157
Baphia	34164	Hyphaene	34219	Phoenix	34213
Beta	34252	Juglans	34254	Prunus	34134
Boscia	34177	Juniperus	34140-145	Schefflera	34123
Capparis	34165	Kraussia	34169	Strychnos	34161
Carissa	34153	Maba	34170	Triticum	34126
Clavija	34122	Mangifera	34199-205	Turraea	34179
Dovyalis	34250				

PLATE: Castanea sp. Chinese chestnut.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

AMYGDALUS PERSICA. (Amygdalaceae.) 34131. Seeds of a peach from Guadeloupe, French West Indies. Presented by Mrs. F. T. F. DuMont. "In Florida there is a peach, which ripens in May and which is locally called the 'pinto peach.' I have never seen this peach below Rockledge. There is a peach here that is very much like it in shape and taste and grows and bears well and stands the heat. Its shape is long with a decided point at the apex. The stems are slightly indented in the fruit. The fruit is easily detached when ripe. The pulp is juicy, homogeneous and not stringy. It has more perfume and savor and is larger than the Florida peach. It is a freestone and peels easily. It is round, not flattened, averaging 1½ inches in diameter. It resists decay well, even in this heat (from 76° F. our coolest nights, to 90° always in the afternoons), some of the fruit lasting after being gathered for four days." (Mrs. F. T. F. DuMont.) For distribution later.

ANANAS SATIVUS. (Bromeliaceae.) 34124. Seeds of a pineapple from Brisbane, Queensland. Presented by Mr. William Soutter, secretary and manager, Queensland Acclimatisation Society. "Some interesting developments may be looked for from these seeds, as they are from a smooth Cayenne crossed with pollen from the Ripley Queen. The fruit weighed with the top, turned the scale at eleven pounds. During this past thirty years I have raised upwards of 30000 plants from seed. These have been for the greater part discarded as useless, the selected types now numbering about a dozen and these show constancy, and some possess high qualities. The smooth pine is an exceptionally shy seeder,and responds tardily to pollination, but not so the rough ones, which are readily pollinated and produce abundance of seeds." (Soutter.) For distribution later.

ANTIDESMA VENOSUM. (Euphorbiaceae.) 34163. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Durban Botanical Garden. "An euphorbiaceous shrub or small tree five to fifteen feet in height, having a wide distribution through Central, East and West Africa. The smooth dark-red fruit one-half inch long or less is eaten by natives and children. They are not very palatable and probably might be injurious if eaten in quantity." (Sim, Forest Flora of Cape Colony.) For distribution later.

ASPARAGUS TRICHOPHYLLUS. (Convallariaceae.) 34133. Seeds of an asparagus from Novospassko, Russia. Presented by Mr. A. D. Voeikov. "An asparagus of twining habit, found in sandy and alkaline deserts in Central Asia. Of possible value in breeding work." (Frank N. Meyer.) For distribution later.

BAPHIA RACEMOSA. (Fabaceae.) 34164. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanical Gardens. "An erect shrub or small branched tree with ascending branches. It is easily distinguished from all leguminous Cape shrubs in having simple, unifoliate ovate-lanceolate leaves. It has ornamental, white, strongly violet-scented flowers, with an orange spot at the base of the standard, and is known in Natal as the violet pea. The wood is too small to be used for timber, but if cut in winter, peeled at once and seasoned makes good implement handles." (Sim, Forest Flora of Cape Colony.) For distribution later.

BETA SP. (Chenopodiaceae.) 34252. Seeds of a wild beet from Artwin, Caucasus. Presented by Mr. A. Rolloff, Director, Botanical Gardens, Tiflis, Caucasus. This wild beet seed from the shores of the Black Sea was secured for the use of plant breeders interested in the improvement of this crop. For distribution later.

BOSCIA UNDULATA. (Rutaceae.) 34177. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A large evergreen tree, often two to five feet in diameter with clean tall stems in high forests; frequent also as a bush or small spreading tree in scrub forests. The seeds germinate easily and the cultivation of the tree is simple. Timber white, close-grained, tough, hard and heavy, usually to be had sound in the mountain forests up to two feet in diameter and with ten to twenty rings to the inch. Used mostly by wagon-makers. In toughness it is the ash of the South African forests." (Sim, Forest Flora of Cape Colony.) For distribution later.

CAPPARIS CITRIFOLIA. (Capparidaceae.) 34165. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A straggling shrub five to eight feet high, or with climbing branches where protected. Abundant in eastern Cape Colony and also in Natal. A decoction of the roots is used in local and native medicine." (Sim, Forest Flora of Cape Colony.) For distribution later.

CARISSA OVATA. (Apocynaceae.) 34153. Seeds from Sydney, New South Wales. Presented by Mr. J. H. Maiden, Director,

Sydney Botanic Gardens. "From Warialda, New South Wales. Growing at the foot of hills of a volcanic nature, subjected to periodical droughts, early in flowering and late in fruiting. The fruits are small, owing to the extreme drought during the past two years." (Collector's note.) An especially resistant species of Carissa introduced for breeding purposes. For distribution later.

CLAVIJA LONGIFOLIA. (Theophrastaceae.) 34122. Seeds from Trinidad, British West Indies. Presented by Mr. P. Carmody, Director, Department of Agriculture. "An evergreen tree attaining a height of ten to twelve feet, with orange colored flowers in drooping racemes three to four inches long on the trunk; leaves long-lanceolate, acute, spiny-toothed." (Nicholson, Dictionary of Gardening.) For distribution later.

DOVYALIS CAFFRA. (Flacourtiaceae.) 34250. Seeds of the kei-apple from Saff, Egypt. Presented by Mr. Alfred Bircher, the Middle Egypt Botanic Gardens. "A small tree, twelve to thirty feet in height, often thornless when in tree form, but exceedingly thorny when kept cut as a hedge, for which purpose it is much used, as it is impenetrable, and when once established stands drought remarkably well. Seeds soon lose vitality when kept dry, but germinate freely when fresh, and the plants are easily transplanted in the various nursery stages if not allowed to get a secure foothold, which they do rapidly. It does not succeed where frosts are regularly severe, but elsewhere requires to be cut twice a year to keep it in good hedge form, and makes a dense 5-feet hedge in five years. It stands cutting to any extent, and if a hedge has been allowed to make too much headway when young and becomes open below, it can be cut to the ground level and started afresh from the coppice shoots. Blanks in a hedge, if not too wide, can be remedied by interplaiting branches. The fruit is globose or depressed-globose, minutely velvety, 1 to 1½ inches in diameter, bright yellow, resembling an apricot, edible and used in preserves, but of too high flavor to be used alone. It is too sour for dessert use unless perfectly ripened under bright sunshine, and is sometimes attacked by the common peach maggot." (Sim, Forest Flora of Cape Colony.) For distribution later.

ERIOBOTRYA JAPONICA. (Malaceae.) 34119. Seeds of loquats from Rome, Italy. Presented by Dr. Gustav Eisen. "This shipment contains seeds of both the pear-shaped and apple-shaped loquats, of exceptional size, no fruit being less than two inches in diameter and some more. They are the best I have seen this year." (Eisen.) For distribution later.

GARDENIA THUNBERGIA. (Rubiaceae.) 34167. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A small much branched tree, eight to fifteen feet high, with smooth, white, unarmed stem up to nine inches in diameter. Leaves very variable. Flowers terminal, solitary, strongly scented, large, white and attractive. Fruit woody, very hard, oval or oblong, two to four inches long, two inches in diameter, many seeded, remaining on the trees for several years, increasing in size with age, and finally either smooth or roughened but usually white. The strongly scented white flower makes this a favorite garden flowering tree, and it is also used as a stock for grafting the double Gardenia florida upon. The wood is hard, heavy and strong, and used for making tools, etc." (Sim, Forest Flora of Cape Colony.) For distribution later.

GOSSYPIUM SPP. (Malvaceae.) 34184-194. Seeds of cottons from Manila, Philippine Islands. Presented by Mr. M. M. Saleeby, Bureau of Agriculture. Eleven varieties of Philippine cottons sent in in response to requests for native varieties, all for use in breeding work. For distribution later.

GREWIA ASIATICA. (Tiliaceae.) 34181. Seeds from Saff, Egypt. Presented by Mr. Alfred Bircher, the Middle Egypt Botanic Gardens. A soft-wooded shrub or small tree producing a bast fiber much used in rope making. For distribution later.

HYPHAENE SP. (Phoenicaceae.) 34219. Seeds of the doum palm from Hamburg, Germany. Presented by Mr. Robert P. Skinner, American consul-general. Seeds imported to determine the possibility of securing large quantities of good quality doum palm seeds through the German importers of this seed for use in button-making. Immense quantities of seeds are imported through Hamburg to supply the button manufacturers of Germany with a cheap substitute for the vegetable ivory produced by the nuts of Phytelephas species. For distribution later.

JUGLANS NIGRA. (Juglandaceae.) 34254. Walnuts from Sucre, Bolivia. Presented by Mr. Ernest F. Moore, British vice-consul. "Variety boliviensis. These are from the same species of walnut that grows in tropical Santa Cruz but were taken from higher altitude, approximately 7500 feet and not more than one hundred miles from Sucre." (Moore.) For distribution later.

JUNIPERUS SPP. (Pinaceae.) 34140-145. Seeds of junipers from Novospassko, Russia. Presented by Mr. A. D. Voeikov. Six species of juniper from Turkestan and Russia, some

of which may be of value for afforestation work in arid and semi-arid regions. For distribution later.

KRAUSSIA FLORIBUNDA. (Rubiaceae.) 34169. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A small tree up to 20 feet in height and one foot in diameter, with a fluted stem. Leaves evergreen. Fruit a small black berry. Wood heavy, hard, not used." (Sim, Forest Flora of Cape Colony.) For distribution later.

MABA NATALENSIS. (Diospyraceae.) 34170. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A tree twenty to fifty feet high with very horizontal densely foliaged branches. Fruit one half inch in length, acorn-shaped in the green calyx cup, yellow when ripe, rather succulent though hardly edible. Frequent on the coast throughout Natal. Usually on the sand dunes or behind them. Rarely large enough for the wood to be used as timber." (Sim, Forest Flora of Cape Colony.) Introduced as a possible stock for the various species of Diospyros, to which it is closely related. For distribution later.

MANGIFERA INDICA. (Anacardiaceae.) 34199-205. Plants of mangos from Port Louis, Mauritius. Purchased from the Department of Forests and Gardens, through Mr. Gabriel Regnard. Seven varieties said to be the best grown in the island. For distribution later.

MEDICAGO SPP. (Fabaceae.) 34147-151. Seeds of medicagos from Jerusalem, Palestine. Presented by Mr. E. F. Beaumont. Five species, some of which are very drought-resistant. For distribution later.

OMPHALEA SP. (Euphorbiaceae.) 34156. Seeds from Bocono, Colombia. Presented by Mr. W. O. Wolcott, Brooklyn, N. Y. "I can give you no definite information about these nuts except what the natives told me, as I bought them in the town at the foot of the mountains and did not see the trees. The natives told me they grew high up in the mountains where it is quite cold, but not freezing, probably 7000 to 8000 feet or more, as Bocono where I got them is about 5000 feet. They say the trees grow quite large, 12 to 18 inches in diameter and 50 to 60 feet high, and are very prolific in nuts. They call the nuts by two names, Nueces (nuts), and Pan del pobre (poor people's bread). I have traveled for the last twenty years all over Venezuela and Colombia and have never seen them except at this one place. It rains a good deal in those moun-

tains for about six months of the year from April to September or October, but the rest of the year is dry. I got these last March just at the end of the season. I should judge they would make fine stock feed in meal; in fact, the natives eat them and told me they fatten their hogs on them finely as the shells are thin and very brittle. The meats appear to have much oil. I find them rather hard when dry. When I got them the meats were softer than chestnuts when first gathered." (Wolcott.) For distribution later.

ORYZA SATIVA. (Poaceae.) 34220-249. Seeds of rice from Manila, Philippine Islands. Presented by Mr. F. W. Taylor, Director of Agriculture, through Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. Thirty varieties, some of them yielding as much as two and a half tons per acre. For distribution later.

PERSEA LINGUE. (Lauraceae.) 34157. Seeds of lingue from Santa Ines, Chile. Presented by Mr. Salvador Izquierdo. "This is a very valuable industrial forest tree of large size, handsome, compact, evergreen, with glossy gray-green leaves and is an extra quick grower; here it is not a delicate plant but grows quickly in any soil that is wet or very moist, and also in water. The wood is light and tough like elm, but takes a very high finish. Its lumber is highly esteemed and is lasting if protected from the wet; used for furniture, bodies and poles of carts, ox yokes, etc. The wood is the color of white ash, and when finished has a yellowish tinge. It takes any stain. Its bark is solely used for tanning and is largely exported to Europe. Every station in the south is filled to overflowing with thousands of bags of broken bark awaiting transportation. The forests are being stripped, and in a very few years this tree will be very scarce. It is an extra beautiful shade tree. Its leaves are poisonous to animals, especially sheep,who are very fond of them. Medicinally it is a powerful astringent." (Jose D. Husbands.) For distribution later.

PHOENIX DACTYLIFERA. (Phoenicaceae.) 34213. Offshoots of the Medjool date, received through Mr. Walter T. Swingle from Dr. L. Trabut, Government Botanist of Algeria, who secured them from the Er Reteb region, Tafilelt, Morocco through Si Mohammed ben Idris Fassi. "The Medjool date comes from the Tafilelt region in southeastern Morocco. It is the finest variety in the Tafilelt country but is unknown in America and comparatively little known in Europe, except in England and Spain, in both which countries it brings a higher price than any other date on the market, in spite of the fact that it

is almost never put up in attractive form but is sold in bulk. Dates of this variety can be found in practically every grocery in Spain where they are known as "Datiles de Berberia." The fruit is large, from two to two and a half inches long, and from three-fourths to one inch thick. It is semi-translucent, dark brown in color, and has flesh rather firm in texture of a most delicious flavor. It is much darker in color than the Deglet Noor variety, and keeps much better. The dates always have the calyx attached to the stem end. This gift from the Service Botanique of the Algerian government to the Department of Agriculture marks an epoch in American date culture. These selected offshoots from the best locality in Tafilelt will not only show how this famous variety succeeds in the New World deserts, but will also make it possible to determine how truly it has been reproduced by the seedlings, some thousands of which are already growing in California." (Swingle.) For distribution later.

PRUNUS SIBIRICA. (Amygdalaceae.) 34134. Seeds of a Prunus from Novospassko, Russia. Presented by Mr. A. D. Voeikov. "A species of Prunus, closely related to the apricots, occurring in Eastern Siberia, Manchuria, and Mongolia. May be of value for breeding experiments." (Frank N. Meyer.) For distribution later.

SCHEFFLERA ACTINOPHYLLA. (Araliaceae.) 34123. Seeds of the "pinankaral" from Wellington Point, near Brisbane, Queensland. Presented by Mr. James Pink. "This is best known as the Queensland umbrella tree, which is a truly descriptive term for the growth of the foliage. It grows 20 to 30 feet high and has flowers on a terminal spike." (Pink.) For distribution later.

STRYCHNOS GERRARDI. (Loganiaceae.) 34161. Seeds of the quaqua from Mozambique, Portuguese East Africa. Presented by the Inspector of Agriculture. "A small tree, from three to ten metres high, without thorns and with exceedingly variable leaves. Fruit one-celled, globose, two to three inches in diameter, glaucous, glabrous, often spotted, with a hard shell, and numerous flat seeds lying in acidulous edible pulp." (Sim, Forest Flora of Portuguese East Africa.) For distribution later.

TRITICUM SP. (Poaceae.) 34126. Wheat from La Guaira, Venezuela. Presented by Mr. Thomas W. Voetter, American consul. "The grower of this wheat stated that it came to Venezuela originally from the Canary Islands and that it has been found to be the best variety known here to resist dry weather.

The sample sent was from a field that was not irrigated and received no rainfall from the time of sowing until harvested." (Voetter.) For distribution later.

TURRAEA OBTUSIFOLIA. (Meliaceae.) 34178. Seeds from Durban, Natal. Presented by Dr. J. Medley Wood, Director, Durban Botanic Gardens. "A free-flowering shrub, from three to five feet high, common on the dunes along the coast of Cape Colony and Natal. It is never large enough to be of economic value further than its use in holding fully exposed sea dunes; its showy flowers and seeds make it worthy of cultivation where it will grow." (Sim, Forest Flora of Cape Colony.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

INDIA. Saharanpur. Mr. A. C. Hartless, Superintendent of the Government Botanic Gardens, writes July 11 in regard to mangos: "I am not prepared to enter into the question of whether the mango has an existant wild progenitor or not. Botanists are themselves apparently not certain on this point. The study of mangos has chiefly been confined to what may be called cultivated varieties, but there are an enormous number of uncultivated varieties, that are called wild, but are not really so. Many of these are very good, although wanting in size as compared with the garden varieties. There is one aspect about these so-called wild mangos that has been generally overlooked; that is the particular way in which their fruit can be utilized. By the natives nearly all are sucked and not the flesh eaten. I have this season tested many, and I was very much astonished to find out how pleasant and refreshing they are, when sucked, much in the way a lemon would be. Their juice mixed with aerated waters makes a very delicious and refreshing drink. To my mind for a country like America where such drinks are greatly appreciated, such a class of fruit would be a boon.

The trees bear prodigiously, the fruit is easily sent long distances, and probably some method could be devised of keeping the juice for some time. In this line there are I think enormous possibilities. In addition you will have a very fine tree, that gives excellent shade and produces first class timber. Seed could be easily introduced, and when once the tree begins to fruit, it would soon propagate itself. It would take probably from 10 to 15 years before the plant would fruit.

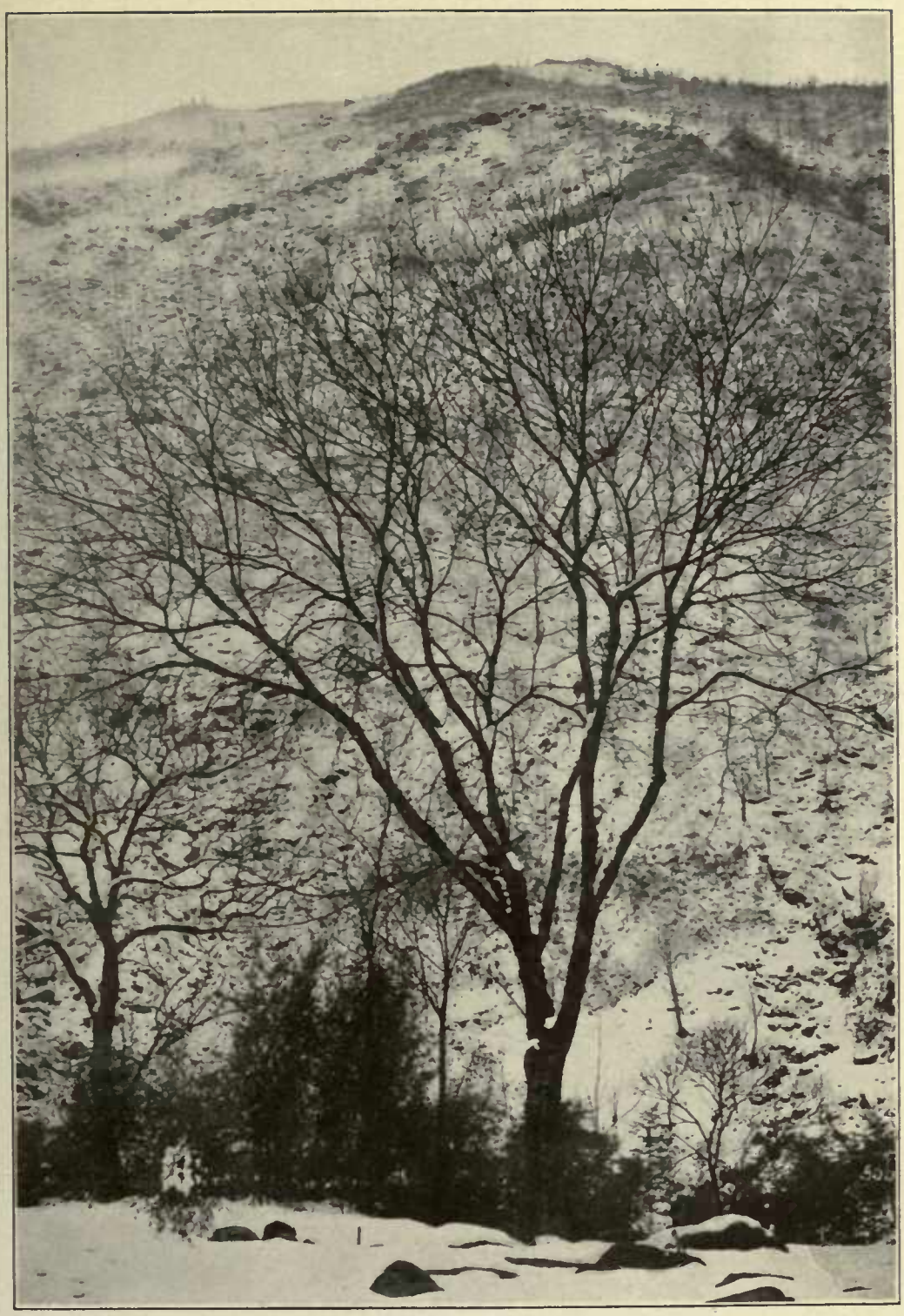
This year being an excellent fruiting year, I have been studying mangos a good deal, and I am astonished to find such a large number of excellent varieties that are undoubtedly seedlings even amongst our garden kinds.

With regard to your inquiry about the number of stamens in a flower. I have not made a particular study of this point, but so far as my memory goes only one fertile stamen was observed to one flower. Climatic conditions at the time of flowering very largely influence pollinating. Some years a crop is completely destroyed by rain or cloudy weather at the time of flowering. This year I experimented with bagging the flowers in order to prevent cross fertilization; although some fruits set, yet they dropped off very soon. A light, dry, and airy time is needed at time of flowering to ensure successful pollinating, and no irrigation should be done at that time.

Of the two varieties you mention I only know one, Mulgoa, this fruit is all right. I have never heard of a case where staminate flowers only are produced, although the inflorescence is of course polygamous.

There is one other point that I should like to bring to your notice, and that is our so called country Plums. These are supposed to be varieties of Prunus domestica, var. insititia. (Syn. P. Bokhariensis). These are supposed to have originally come from Bokhara. They are a distinct class of fruit, many are excellent, but I can find no record of them being grown in any other country than India. You may probably have come across them elsewhere in your extensive travels, and must have noticed them when you were in India. I hope to make a detailed study of them next year."

(Issued September 21, 1912.)



CASTANEA SP. Chinese chestnut.

Young trees of this wild chestnut are growing in this country in areas affected by the chestnut bark disease (Diaporthe parasitica Murr.) It is hoped that this species may be immune to this malady, which is killing out the native chestnut trees of the country, and may prove a substitute for our species. Its nuts are of fair quality.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 80.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

Aug. 16 to Sept. 30, 1912.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Acacia	33913	Eugenia	33958
Amerimnon	33917	Exogonium	33961
Astronium	33922	Gossypium	34289
Baryxylum	34330	Gourliea	33970
Bischofia	34263	Orania	34319
Bromelia	33930	Pancratium	34260
Caesalpinia	33933	Phalocallis	33996-997
Caryophyllus	34309	Piper	34327-328
Celtis	33938	Piptadenia	34000-001
Corylus	34266	Pittosporum	34306
Dolichandra	33953	Primula	34308
Echium	34258	Prunus	34264-265
Enterolobium	33955		34267-268
Euchlaena	34257		

PLATE: Salix sp.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

ACACIA MONILIFORMIS. (Mimosaceae.) 33913. Seeds of an acacia from Buenos Aires, Argentina. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A low bushy yellow-flowered shrub found in the vicinity of Tucuman. The young pods are used as fodder for cattle." (Mueller, Select Extra-Tropical Plants.) For distribution later.

AMERIMNON NIGRUM. (Fabaceae.) 33917. Seeds of the caviuna from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A large Brazilian tree, furnishing the finest quality of rosewood." (Lindley, Treasury of Botany.) For distribution later.

ASTRONIUM BALANSAE. (Anacardiaceae.) 33922. Seeds from Buenos Aires, Argentina. Presented by Dr. Carlos Thays, Director, Botanic Garden. A hard-wooded timber tree, highly valued in northern Argentina and Paraguay. For distribution later.

BARYXYLUM INERME. (Caesalpiniaceae.) 34330. Seeds from Manila. Presented by Mr. E. D. Merrill, Botanist, Philippine Bureau of Science. "This tree is a native of the Philippines and is one of the best shade trees that we have. It is evergreen and bears large terminal panicles of very showy yellow flowers. The species is of wide distribution in the Malayan region, and in the Philippines grows in nature near the sea shore. It will certainly thrive in Cuba, Porto Rico, and Panama, and probably in southern Florida and southern California." (Merrill.) For distribution later.

BISCHOFIA JAVANICA. (Euphorbiaceae.) 34263. Seeds of the toog from Buitenzorg, Java. Presented by the Director, Department of Agriculture. "A tall tree, known as toog, with a fairly regular, unbuttressed short bole with a wide-spreading crown. It is intolerant of shade. The bark is dark brown, soft to the touch, shedding in thin large scales. The inner bark is red with a thin, dark-red latex. The leaves are alternate, trifoliate and smooth, with the edges of the leaflets toothed. The sapwood is light cream color, the heartwood is red, moderately hard and moderately heavy." (Whitford, Forests of the Philippines.) A beautiful specimen which has been identified as this species, now 40 feet high, is growing at Reasoner Brothers' Nursery, Oneco, Florida. For distribution later.

BROMELIA CARAGUATA. (Bromeliaceae.) 33930. Seeds of the caraguata from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. An Argentine fibre plant the fibre from which is used in making the famous nanduti lace of Paraguay. It is also used for cordage, and rope made from the fibre in some rough tests has compared well with German manila rope. For distribution later.

CAESALPINIA MELANOCARPA. (Caesalpiniaceae.) 33933. Seeds from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A stout bushy-topped leguminous tree found in the woods in the vicinity of Tucuman in Argentina. The fruits contain considerable tannin, and the hard, almost black wood is used for building wagons and for framing houses." (Venturi, Trees of Argentina.) For distribution later.

CARYOPHYLLUS SP. (Myrtaceae.) 34309. Seeds from Paraguay. Presented by Mr. C. F. Mead. "In Guarany, this fruit is called Ywapuru. I have never seen it in any place except in the woods in the district between Sapucay and Asuncion, nor can I find any mention of it in botanical books. It grows in bush form to a height of about two meters, the fruit which is about the size and coloring of a dark red plum, being borne in clusters about the main stalks. I have never tasted the fruit but it is very highly spoken of by natives here." (Mead.) For distribution later.

CELTIS TALA. (Ulmaceae.) 33938. Seeds from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A thorny tall shrub or small tree, suitable for hedges and street-planting, found in the lower part of the valley of La Plata in Argentina and Uruguay." (Venturi, Trees of Argentina.) For distribution later.

CORYLUS AVELLANA. (Betulaceae.) 34266. Seeds of a filbert from Boscotrecase, near Naples, Italy. Presented by Dr. Gustav Eisen, San Francisco, Cal. "This San Giovanni filbert is the earliest filbert known in this part of Italy, ripening by June 24th. Of very good quality, though not as highly flavored as the wild nut, but remarkably well filled and solid. Valuable on account of its earliness." (Eisen.) For distribution later.

DOLICHANDRA CYNANCHOIDES. (Bignoniaceae.) 33953. Seeds from Buenos Aires, Argentina. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A shrubby vine with trumpet-shaped, reddish-purple flowers found in the extra-tropical forests of Brazil." (Lindley, Treasury of Botany.) For distribution later.

ECHIUM BOURGEANUM. (Borraginaceae.) 34258. Seeds from Teneriffe, Canary Islands. Presented by Dr. George V. Perez, Puerto Orotava. "A very striking Teneriffe alpine plant growing at the Canadas on its rocky walls at an elevation above sea level of between 8000 and 9000 feet. It throws up in the second year a single thyrse of beautiful pink flowers. I have just had one in flower 3½ meters high(11 feet, eight inches.) It may turn out to be a valuable fodder plant in southern California, as goats are very fond of it. Its rosette of leaves is more than a yard across." (Perez.) For distribution later.

ECHIUM CANDICANS x SIMPLEX. (Borraginaceae.) 34259. Seeds from Teneriffe, Canary Islands. Presented by Dr. George V. Perez, Puerto Orotava. "A new hybrid obtained this year by the writer. The thyrse is light blue. It is a beautiful plant." (Perez.) For distribution later.

ENTEROLOBIUM CONTORTISILIQUUM. (Mimosaceae.) 33955. Seeds of the timbo from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A large leguminous timber tree, found in Paraguay. It is often planted as a street tree, the wood is much used in carpentry, and the fruits, called 'orejas de negro,' are used to remove spots from linen." (Venturi, Trees of Argentina.) For distribution later.

EUCHLAENA MEXICANA. (Poaceae.) 34257. Seeds of teosinte from Durango, Mexico. Presented by Mr. T. C. Hamm, American consul, who obtained it from Dr. H. W. Jackson. "The plant known as teosinte or asese which is supposed to be the antecedent of common maize grows in some parts of the State of Durango. The plant occurs in a wild state, only one attempt so far as I have been able to learn having been made to cultivate it. Two or three years ago a Mexican ranchman gathered a quantity of the seed which he planted as a forage crop, with most excellent results. The plant flowers in the month of July and matures in November. The height attained by the plant varies greatly according to soil, climatic conditions, etc., the full grown plant running from about fifty to seventy five inches in height in this state. The teosinte closely resembles the common maize in its earlier stages, but becomes much more bushy as it develops, due to the large number of suckers thrown out by the parent stalk. The leaf is very similar to that of the maize in all stages of its development. A single stalk of teosinte will have from ten to fifteen ears, which, unless the teosinte has mixed with maize, have practically no cob or core. The reason why little or no use is made of this valuable plant is that when planted near corn it read-

ily crosses with the latter and spoils the corn crop, which is the staple agricultural crop of this district. It is reported that the natives have made 'tortillas' from the ground seed of the teosinte, but such instances are very rare." (Hamm.) For distribution later.

EUGENIA MATO. (Myrtaceae.) 33958. Seeds of a Eugenia from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A tree with edible fruits, forming the principal part of the forests in the vicinity of Tucuman in Argentina." (Venturi, Trees of Argentina.) For distribution later.

EUGENIA PUNGENS. (Myrtaceae.) 33959. Seeds from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. A hard-wooded tree, from the province of Sao Paulo, Brazil, which bears edible fruits. For distribution later.

EXOGONIUM PURGA. (Convolvulaceae.) 33961. Seeds of the jalap from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. "A Mexican climbing plant, with salver-shaped purplish flowers, which furnishes the true jalap tubers of commerce. These are roundish, of variable size, the largest being about as large as an orange, and of a dark color. They owe their well-known purgative properties to their resinous ingredients, and hence worm-eaten tubers are more valued than sound ones, as the insects eat the farinaceous and woody portions of the tuber and leave the resin." (Masters, in Lindley, Treasury of Botany.) For distribution later.

GOSSYPIUM HIRSUTUM. (Malvaceae.) 34289. Seeds of Cambodian cotton from Coimbatore, India. Presented by R. Cecil Wood, Esq., President Agricultural College, through Mr. C. V. Piper. "This cotton has a close resemblance to the American Upland type and has been looked upon as an American cotton that has been acclimatized in Cambodia, though this may not prove to be the case. There is historical evidence of the introduction of a superior type of cotton from Siam to Louisiana in early days, and this may have been the origin of the long staple varieties formerly grown so extensively in the Delta regions of Louisiana and Mississippi. Thus the Cambodia cotton may prove to be related to the American long staple type. A variety of Upland cotton from Cochin China was studied in Egypt in 1910, which may prove to be similar to the present importation. An account of this cotton was published in Bulletin No. 210 of this Bureau series under the title Hindi Cotton in Egypt. The Cambodia cotton has been grown for a few years in southern India and has given much better

than any variety introduced from America. An account of the experiments in India was published in the Daily Consular and Trade Reports, December 7, 1910." (O. F. Cook.) For distribution later.

GOURLIEA DECORTICANS. (Fabaceae.) 33970. Seeds of the chanar from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Gardens. A shrubby legume often forming a small tree having fleshy pods with a single seed and a small yellow pea-like flower. The pulp of the fleshy pods is used to flavor wines in Buenos Aires and is a favorite fruit of the Argentinos. For distribution later.

ORANIA REGALIS. (Phoenicaceae.) 34319. Seeds of a palm from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Philippine Bureau of Agriculture. "A rare palm of the Philippines, rather closely related, I believe, to the coconut, and which, I believe, would make an interesting greenhouse plant; it should also make a good ornamental for southern Florida, Porto Rico and Cuba." (Barrett.) For distribution later.

PANCRATIUM CANARIENSE. (Amaryllidaceae.) 34260. Seeds from Teneriffe, Canary Islands. Presented by Dr. George V. Perez, Puerto Orotava. A bulbous plant with iris-like leaves and umbels of large white flowers, found in the Canary Islands. For distribution later.

PHALOCALLIS SPP. (Iridaceae.) 33996-997. Seeds from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. Two perennials of the iris family, commonly known as Cypella spp. having yellow flowers, and occurring in Brazil, Paraguay and Argentina. For distribution later.

PIPER CHABA. (Piperaceae.) 34328. Seeds of the chaba from the Jardin Colonial, Nogent sur Marne, France. Presented by the Director, Mr. E. Prudhomme. "A native of the Moluccas, cultivated in India for its fruit, the chaba of Indian medicine. The wood and root are used in Bengal for dyeing and give a pale brown on cotton if used alone, but mixed with Caesalpinia sappan, a brownish-red." (Watt, Commercial products of India.) For distribution later.

PIPER CUBEBA. (Piperaceae.) 34327. Seeds of the cubeb pepper from the Jardin Colonial, Nogent sur Marne, France. Presented by the Director, Mr. E. Prudhomme. "The cubebs of commerce, which are of importance chiefly in medicine, are the berries of a species of pepper-vine, easily distinguished from

the ordinary pepper by the stalked and larger berries or 'corns.' The plant is a native of Java, Sumatra , etc., and thrives under similar conditions as pepper, requiring live or rtificial supports and a certain amount of shade. The world's supply of cubebs is obtained chiefly from Java, where the plant is cultivated. The plants are best propagated by cuttings taken from among the top or fruitful shoots, such plants being more productive than those taken from near the base." (MacMillan, Handbook of Tropical Gardening.) For distribution later.

PIPTADENIA SPP. (Mimosaceae.) 34000-001. Seeds from Buenos Aires. Presented by Dr. Carlos Thays, Director, Botanic Garden. Two trees forming large forests in Argentina, one furnishing the angico-gum somewhat similar to gum-arabic, and both rich in tannin, the bark sometimes running 40 per cent. For distribution later.

PITTOSPORUM EUGENIOIDES. (Pittosporaceae.) 34306. Seeds of the tarata from the Royal Botanic Garden, Edinburgh, Scotland. Presented by Prof. Bayley Balfour, Director. "A beautiful New Zealand tree whose pale-green leaves with undulating margins, emit, when bruised, a lemon-like odor. The delicate venation and light-colored, almost white, midrib add to the beauty of the leaf. The Maoris mixed the resinous exudation from the bark with the juice of the sow-thistle, and worked it into a ball, which they chewed. In October the tree produces masses of yellowish-green flowers, whose heavy honied odor is almost sickly in its intensity. According to Mr. G. M. Thomson, the plant is probably often self pollinated; but Mr. Kirk points out in his Forest Flora, that, though stamens and pistils are always present, one or other is often abortive, so that the flowers are often practically unisexual. The wood of this species, like that of the other species of the genus, is almost worthless. The tree is often cultivated for its beauty, and is sometimes - though not so often as P. tenuifolium - used to form an ornamental hedge." (Laing and Blackwell, Plants of New Zealand.) For distribution later.

PRIMULA FORRESTII. (Primulaceae.) 34308. Seeds of a primrose from the Royal Botanic Garden, Edinburgh, Scotland. Presented by Prof. Bayley Balfour, Director. "This primrose from southwestern China grows to a height of 3 feet, has a woody rootstock, and deep yellow flowers with an orange eye. Both flowers and foliage are fragrant. First collected by Mr. George Forrest, who found them growing pendulous from dry, shady crevices of limestone cliffs on the eastern flank of the Lichiang Range, northwestern Yunnan, at an altitude of from

9000 to 11000 feet." (Forrest, Primulaceae from western Yunnan.) For distribution later.

PRUNUS ARMENIACA. (Amygdalaceae.) 34264-265. Seeds of apricots from Rome. Presented by Dr. Gustav Eisen, San Francisco, Calif. 34264. "These seeds were procured in a restaurant in Rome. Locality not known. This variety is probably the finest apricot I have tasted, being larger than our average Moorpark, globular but with apex characteristically pointed, the point being short but very acute and set off suddenly and distinctly. Ripe evenly all around. Very sweet and highly flavored. Color deep orange." For distribution later.

PRUNUS DOMESTICA. (Amygdalaceae.) 34267-268. Seeds of plums from Rome. Presented by Dr. Gustav Eisen, San Francisco, Calif. 34267. "Papagone. Average 2½ inches long by 1½ inches wide. Largest 2¾ to even 3 inches long by 1⅝ inches wide. Elongated ovoid. Greenish yellow, with darker green on shaded side. Stalk a short half inch or less long. Fine grey bloom. Very thin and smooth skin. Seed very thin pitted, sulcate edge and remarkably small for the size of the fruit. Flesh firm, sweet and highly flavored, adhering slightly to the stone." 34268. "Prune called Prunaringia grown near Naples. The name may also, and more properly be spelled Prunarigno or Prunarignia, and I am told that possibly it means Prune of India, though I prefer to think that the name in some way refers to the main characteristic of the fruit; one or two vertical cracks, 'rigno,' when the fruit is fully ripe. In size this prune or plum resembles the Papagone but is more irregular. General shape like Papagone but the color is deeper green. Very sweet and even more flavored, but the value of this splendid plum is lowered by the fact that when ripe it always possesses one or two vertical splits on the cheek. Thus it does not present the same fine appearance as the Papagone and could not stand long shipment. But for canning and preserves this plum should be excellent. The seed in proportion to the fruit is considerably larger than the Papagone but somewhat similar in shape; thin and oblong but less curved than in that fruit. Both ripen at about the same time and are at the height of perfection at Boscotrecase by August 1." (Eisen.) For distribution later.

NOTES FROM FOREIGN CORRESPONDENTS.

AFRICA. Southern Nigeria. Mr. Frank Evans writes under date of August 16, 1912. "After leaving Honolulu in April 1911, I took a trip around the Orient, visiting and studying

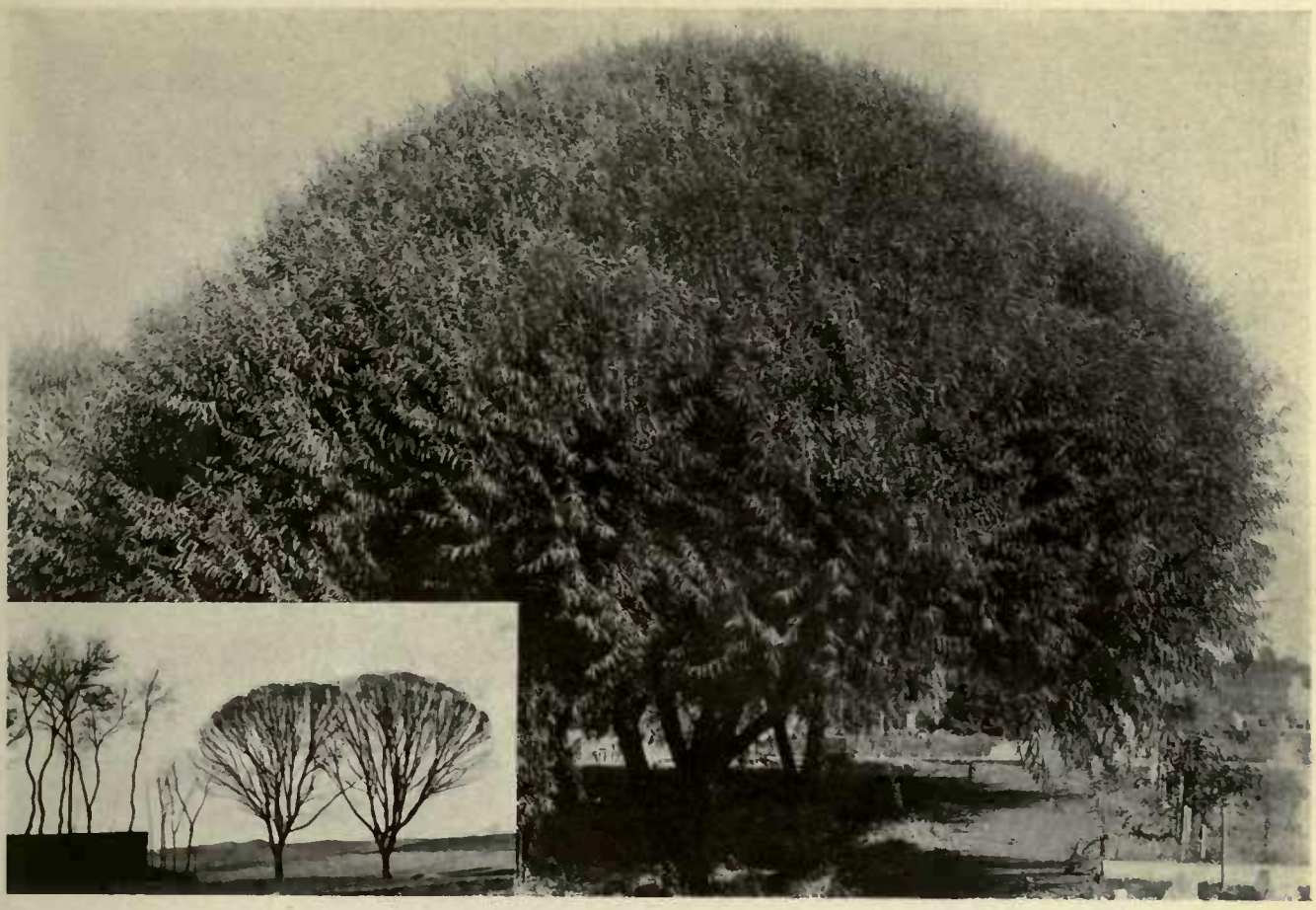
agricultural methods and conditions in Japan, Malay States, Java, Ceylon and Egypt, and then returned to the Trinidad Department for a month or two and have now been appointed Superintendent of Agriculture in the Eastern Province of Southern Nigeria. There is good work to be done here, but it is chiefly of a pioneer character. I only arrived four days ago and as soon as I get settled down, I will ask your aid in obtaining seed of useful economic plants and in return will send you seeds of economic Nigerian plants. Like all West African coast places this climate is bad and I don't suppose I shall be able to stand it for very long, but the experience is interesting and should be useful."

CHINA. Szechuan, Kwan hsien. Mr. H. J. Openshaw writes under date of August 8, 1912; "we were able to 'stand by the ship' right through all the turmoil of revolution. Our city was beseged twice and all 'shot up'. I jumped in and became 'Surgeon General' etc. and really did a lot of good work caring for the sick and wounded. We are on the mountain for a rest and change. It is very delightful; we are really avoiding a hot Chinese summer. My, but a Chinese city with its walls and crowds can be HOT.

To the East we look out on the great Chentu plain, now laden with a heavy rice crop; while to the West we see range after range of mountains with the snow peaks of Thibet for a background.

Szechuan seems slowly getting back to normal. Funds were short and a lot of paper money was issued, of which business men are scarey.

The Thibetans are in revolt and have captured several border cities, but a large force of soldiers have gone forward and it is hoped Thibet will come back into line. In the past she has fared ill at the hands of the Chinese and takes this opportunity to protest."



SALIX SP. Globular-headed willow. S. P. I. No. 17737.

A remarkable Chinese willow, with a dense, naturally flattened globular head, collected by Mr. Frank N. Meyer at Scha-ho-schonn, northern China. The small insert shows the trees as they appear in winter in their native country, while the large photograph shows one of several specimens which are growing in the grounds of the City Cemetery at Chico, California. They were grown from cuttings sent in by Mr. Meyer in March, 1906. This exceedingly handsome tree is growing along an old swale where it seems to thrive with a minimum amount of water, and on August 13, 1912, when photographed it was about 20 feet high, with a spread of about 30 feet, and its trunk was about 47 inches in circumference. From photos by Messrs. Frank N. Meyer and P. H. Dorsett, respectively.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 82.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

December 1, 1912, to January 15, 1913.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Acanthophoenix	34725-726	Faradaya	34696
Antidesma	34691	Gaultheria	34718-719
	34695	Jatropha	34714
Archontophoenix	34738	Metrosideros	34715
Argania	34667	Momordica	34692
Canarium	34694	Nicotiana	34752-754
Canavali	34705-709	Osterdamia	34657
Clianthus	34716	Pasania	34642
Curcuma	34773	Persea	34698
Diospyros	34697	Pittosporum	34722
	34711	Populus	34789-801
	34713	Quercus	34710
Eucalyptus	34661		

PLATE: Quercus suber.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

ACANTHOPHOENIX SPP. (Phoenicaceae.) 34725-726. Seeds of palms from Port Louis, Mauritius. Presented by Mr. G. Regnard. Prickly palms, one of which, A. rubra, is said to have proved hardy in Florida. and to grow to a height of 60 feet. The upper rings of the stem are bright red. For distribution later.

ANTIDESMA BUNIUS. (Euphorbiaceae.) 34691. Seeds of the bignay from Manila, Philippine Islands. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "A small handsome tree, dioecious, with simple, dark green, leathery leaves. The fruit is small, dark red, sweet, subacid in flavor, and produced in long racemes like the currant, and may be eaten raw or made into jelly." (Barrett.) For distribution later.

ANTIDESMA NITIDUM. (Euphorbiaceae.) 34695. Seeds from Los Banos, Philippine Islands. Presented by Mr. C. F. Baker, College of Agriculture, University of the Philippines. "One of the finest local shrubs, of good shape and covered with great numbers of pendant clusters of small berries which are long, bright red, finally black, and which are edible. This should make an important addition to ornamental shrubs for warm countries." (Baker.) For distribution later.

ARCHONTOPHOENIX ALEXANDRAE. (Phoenicaceae.) 34738. Seeds of the Alexandra palm received from Lawang, Java. Presented by M. Buysmann. "The wood of this Queensland palm is beautifully marked, and is much in favor for walking sticks, the outer portion being cut into suitable thickness for this purpose. It grows to a height of 70 or 80 feet." (Maiden, Useful native plants of Australia.) For distribution later.

ARGANIA SPINOSA. (Sapotaceae.) 34667. Seeds of the argan from Tangier, Morocco. Presented by Mr. Maxwell Blake, American-Consul General. "The argan is a small tree with the appearance of the olive, and rarely exceeding 5 meters in height. Its young shoots are spiny and its leaves persistant. Its fruit is an ovoid drupe, greenish yellow, containing generally one but sometimes from 1 to 4, seeds, with a white kernel which yields 51.25 percent of a non-drying sweet oil, very much esteemed by the inhabitants of Morocco. The production of argan oil, in good years, according to M. Gentil, amounts to about 7,500,000 pounds, almost entirely used locally." (Capus and Bois, Produits Coloniaux.) For distribution later.

CANARIUM SP. (Balsameaceae.) 34694. Seeds of the pili nut from Manila, Philippine Islands. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "A large tree indigenous to the Philippines, that produces an edible nut of excellent quality. There are two species, C. ovatum and C. pachyphyllum, the nuts of which are very similar to each other. It is impossible, not having seen the tree from which the nuts were obtained, to say to which species the nuts belong which are being sent to you. Pili nuts are to some extent cultivated in southeastern Luzon interplanted with coconuts." (Barrett.) For distribution later.

CANAVALI SPP. (Fabaceae.) 34705-709. Seeds from Miami, Florida. Grown by Mr. Edward Simmonds at the Plant Introduction Field Station. "This seed was received in 1908 from Mr. J. S. Houser of the Cuban Experiment Station. It has proven very satisfactory as a green manure crop at Miami, the plants continuing to grow throughout the winter season." (Simmonds.) For a discusson of two of the species of this genus, see Mr. C. V. Piper's "The Jack Bean and the Sword Bean" in Miscellaneous papers, Circular No. 110, Bureau of Plant Industry, just published. For distribution later.

CLIANTHUS PUNICEUS. (Fabaceae.) 34716. Seeds of the kowhai from Wellington, New Zealand. Presented by Mr. G. J. Clapham, Public Works Department. "A white-flowered form of the kowhai, which in its scarlet-flowered form is one of the most gorgeous of New Zealand flowering plants. With its flowers two inches in length in long pendulous racemes and its heavy, dark-green glossy pinnate leaves it should prove a desirable addition to the drooping shrubs suitable for growing in regions having but slight frosts. The flowers are said to be pollinated by birds in its native haunts." (Blackwell and Laing, Plants of New Zealand.) For distribution later.

CURCUMA LONGA. (Zinziberaceae.) 34773. Roots of turmeric from Usumbwa, German East Africa. Presented by the Usumbwa Company, Post Tabora, Usumbwa. "Resembles ginger in the nature and form of its rhizomes and rounded tubers, but larger and shorter. In commerce they are separated into longs and rounds. In India much of the turmeric is used for dyeing silk, because the tuber contains a starch associated with a coloring matter (curcumine), of a beautiful orange yellow. Because of its essential aromatic oil it is used as a condiment in the Far East and especially in the manufacture of curry. Many tribes of Polynesia use it to stain their bodies and their hair. Curcuma is known still in the spice trade under the name of Indian saffron, and in the West Indies,

under that of coolie saffron." (Capus and Bois, Les Produits Coloniaux.) For distribution later.

DIOSPYROS KAKI. (Diospyraceae.) 34697. Cuttings of persimmon from Seoul, Korea. Presented by the American Consul-General, Mr. George H. Scidmore. "A hardy persimmon tree growing in the compound of this Consulate General, of the 'sheep nose' variety, said to have such good keeping qualities as to keep until a late Easter." (Scidmore). For distribution later.

DIOSPYROS KAKI. (Diospyraceae.) 34711. Cuttings of persimmon from Canton, China. Presented by Mr. G. Weidman Groff, Canton Christian College. "Taai Hung T'sz. Large red persimmon. This is decidedly the largest and sweetest persimmon I have ever seen. It does not have any of that astringent taste so common to the persimmon. It is very highly cultivated; rarely do you find a seed. The skin is thin and of a deep red color. Fruit that I have had on my own table of this variety measures eight inches around at its greatest circumference." (Groff.) For distribution later.

DIOSPYROS SP. (Diospyraceae.) 34713. Cuttings of a persimmon from Canton, China. Presented by Mr. G. Weidman Groff, Canton Christian College. "Kaai Sam T'sz. Chicken Hearted Persimmon. This is a rather inferior persimmon not commonly sold on the markets. The fruits are about the size and shape of a small egg and very difficult to ripen. A common method employed by the Chinese for ripening this fruit is to cover them over with the leaves of the bastard banyan tree for several days; of course we do not have frost here. This persimmon is used as the stock on which to graft the finer varieties." (Groff.) For distribution later.

EUCALYPTUS TRABUTI. (Myrtaceae.) 34661. Seeds of a hybrid Eucalyptus from Algiers, Algeria. Presented by Dr. L. Trabut, Director, Service Botanique. A hybrid found by Dr. Trabut in sowing seeds of Eucalyptus botryoides which stood near a Eucalyptus rostrata. Always tends to revert toward the male parent. It is the first undoubted Eucalyptus hybrid, and the existence of hybrids in this genus has been denied by Baron Ferdinand von Müller. This hybrid is one of the most vigorous of the genus, and in a nursery row at the Mustapha Experiment Station has crowded out the pure species. For distribution later.

FARADAYA SPLENDIDA. (Verbenaceae.) Presented by Mr. William Soutter, secretary and manager, Queensland Acclimati-

sation Society. "A very handsome climber, native of the more tropical regions of Queensland. The outer bark of the plant is used by the natives for stupefying fish. The green bark is tied in small bundles, weighted with a stone and dropped into holes where fish abound, the fish immediately becoming affected and rising to the surface where they are easily caught." (Soutter.) For distribution later.

GAULTHERIA SPP. (Ericaceae.) 34718-719. Seeds from Wellington, New Zealand. Presented by Mr. G. J. Clapham, Public Works Department. "The Gaultherias are the most attractive of the native New Zealand heaths with tiny white bell-shaped flowers." (Blackwell and Laing, Plants of New Zealand.) For distribution later.

JATROPHA CURCAS. (Euphorbiaceae.) 34714. Seeds from Tampico, Mexico. Presented by Mr. Thomas H. Bevan, American Vice-Consul in Charge. "A shrub about the size of a hazel nut bush, with a trunk from six inches to a foot in diameter. Its production is most prolific, the limbs often breaking off from the weight of the nuts. The nuts when first taken from the husks have a dark brown luster, which becomes opaque after being exposed to the air for a few days. When first taken from the tree they have a taste not at all unlike that of the fresh chestnut. They are said to contain about fifty percent of oil, which can be extracted and used for cooking, the same as cotton seed oil. These nuts can be seen growing in the yards of nearly all the Mexican houses in the outskirts of Tampico. The Mexicans prefer them to peanuts maintaining that their flavor is much more delicate. Along the narrow strip of land between the Tuxpam canal and the Gulf of Mexico in the State of Veracruz, they grow wild by the millions, and apparently thrive better in their native state growing in the sand dunes, than in the rich land in the valley of the Panuco." (Bevan.) Various botanists have described the oil as resembling that of the castor bean in its action so that due care should be taken in eating the seeds of this plant. For distribution later.

METROSIDEROS TOMENTOSA. (Myrtaceae.) 34715. Seeds of the pohutukawa from Wellington, New Zealand. Presented by Mr. G. J. Clapham, Public Works Department. "This handsome tree, sometimes 70 feet in height with spreading branches and brilliant scarlet flowers in large terminal cymes rarely grows far from the sea or an inland lake. It finds a foothold in all sorts of impossible looking places. Often it clings to the side of a cliff, and puts forth long twisted roots that attach it to the rocky wall. Specimens may frequently be found hang-

ing from the top of a bank, with the roots above, and the branches almost dipping into the sea below. When growing on level ground, great bunches of red fibrous rootlets may occasionally be seen hanging from the boughs. These do not reach the ground and their function is unknown. The timber is extremely hard and durable." (Blackwell and Laing, Plants of New Zealand.) For distribution later.

MOMORDICA COCHINCHINENSIS. (Cucurbitaceae.) 34692. Seeds from Manila, Philippine Islands. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "An attractive climber of medium vigorous growth, bearing roundish oblong fruits a little larger than an orange, having short orange colored spines." (Barrett.) For distribution later.

NICOTIANA RUSTICA. (Solanaceae.) 34752-754. Seeds of tobacco from Scafati, Italy. Presented by Mr. A. Splendore, Director, Royal Experimental Institute for the cultivation of tobacco. "These Nicotiana rusticas, abundantly fertilized with night-soil (from cess pools or pits) may yield up to 30 or more quintals (3000 lbs.) of leaves per hectare (2½ acres) with a nicotine content of over 10 percent in our climate." (Splendore.) Introduced for the use of tobacco growers interested in the increasing of the nicotine content for nicotine production. For distribution later.

OSTERDAMIA MATRELLA. (Poaceae.) 34657. Seeds of Manila grass from the Philippine Islands. Procured by Mr. C. V. Piper, in charge of Forage Crop Investigations. "This grass is abundant on or near the seashore in the Philippine Islands. Where closely clipped it makes a beautiful lawn. The Luneta in Manila some years ago was planted to Bermuda grass, but at the present time more than 90 percent of the grass is this Osterdamia, which has gradually displaced the Bermuda which it closely resembles in habit and appearance. The grass has unusual promise as a lawn grass, especially near the Gulf Coast and the Atlantic Coast of Florida." (Piper.) For distribution later.

PASANIA CUSPIDATA. (Fagaceae.) 34642. Seeds of an evergreen oak from Yokohama, Japan. Purchased from the Yokohama Nursery Company. An evergreen oak, growing to immense size but also used as a hedge shrub. Promises to be hardy as far north as Norfolk. The small-sized acorns, borne in bunches, have a sweet taste, and are eaten boiled or roasted like chestnuts. For distribution later.

PERSEA AMERICANA. (Lauraceae.) 34698. Seeds of avocado from Rome, Italy. Presented by Dr. Gustav Eisen. "The tree in question is in all probability about 100 years old and, though I do not know for certain, I think it likely to have been imported from Mexico by, or at least at the time of, Valadier, the French gardener and architect, who in the beginning of the nineteenth century arranged the Pincio garden. The tree is growing there in perfect vigor and health. Perhaps about forty feet high and the trunk several feet in diameter. The variety is one which I have never seen on the Pacific Coast of Mexico or Central America. The fruit being 3½ inches long by 2½ inches wide, pear-shaped, that is, tapering toward the stalk end. This year there were 100 fruits or over, all arriving at perfect maturity in October and November, the last ones being picked about November 15. The earlier fruits are larger and may average from ½ inch to 1 inch more than the size given above, which refers to the late fruits. In quality this fruit is equal to the very best that I have eaten in Guatemala and Mexico, and is of exquisite flavor. The seed is perfectly round, pale yellow brown and evidently perfectly developed. The variety is also characterized by its precocity, ripening before frost. It will succeed, without any doubt, in most parts of California, Arizona, southern Texas, the Gulf States generally, in a word in any territory extending from the northern limit of the hardiest orange southward, that means San Joaquin and Sacramento valleys, in California, the Coast Range, etc. Introduced to this territory the tree would prove of immense value and would enter at once into active competition with the Mexican and Island avocados now imported and sold at a prohibitive price." (Eisen.) As the temperatures in Rome average from 44.6° F. to 76.1°, with an absolute minumum of 17.2° F., it will be seen that this tree has considerable promise. However its location may be a very sheltered one, and Dr. Eisen's optimistic report may have to be modified considerably after tests in this country. For distribution later.

PITTOSPORUM RALPHII. (Pittosporaceae.) 34722. Seeds from Wellington, New Zealand. Presented by Mr. G. J. Clapham, Public Works Department. "A beautiful, somewhat laxly branched shrub 15 to 20 feet in height, found in the central district of the North Island of New Zealand. Its dark-crimson fascicled little flower bells with their slightly emergent yellow anther tips, resting on the downy white young foliage, make it, when in bloom, one of the most attractive of the large New Zealand shrubs." (Blackwell and Laing, Plants of New Zealand.) For distribution later .

POPULUS SPP. (Salicaceae.) 34789-801. Plants of poplars from Novospassko, Russia. Purchased from Mr. A. Woeikov. Thirteen species of poplars, all of which are reputed to be of especial hardiness, and several of which are extremely ornamental and more or less resistant to drought and alkali. For distribution later.

QUERCUS SUBER. (Fagaceae.) 34710. Acorns of cork oak from North Augusta, S. C. Presented by Dr. W. E. Mealing. "Collected from trees presumably sent out by the Patent Office before the Department of Agriculture was established." (Mr. Peter Bisset, at whose request they were presented.) For distribution later. See plate.

NOTES FROM FOREIGN CORRESPONDENTS.

BRITISH GUIANA. Georgetown. Mr. Jas. S. Ogilvie writes that so far he has been unable to procure for us the flowers, leaves and fruit of the different poison plants we wanted. He hopes to be able to get at least one blotter through about next March.

Mr. F. A. Stockdale, formerly assistant Director of Agriculture and Government Botanist, has accepted the position of Director of Agriculture of Mauritius.

CHINA. Szechuan. Chentu. Philip Hofman writes August 28: "This is the season of the persimmon out here and if you have ever tasted good Chinese seedless persimmons I know that your mouth will water for them. There are several varieties of the persimmon in West China. At present we are enjoying the red peach shaped variety, and later will come larger square shaped and large tomato shaped kinds. I have also eaten a variety that is very hard to the feel but quite as delicious as the mushy varieties. One eats these like apples rather than like cantaloupes with a spoon."

CHINA. Yunnan. Mr. A.K. Bulley writes from Liverpool, England, that Mr. George Forrest, who has been collecting alpines in Yunnan for an English amateur has been driven back from Teng Guch to Bhamo. Mr. F. Kingdon Ward goes out for Bees Ltd. (Mr. A. K. Bulley) next spring, but "Heaven only knows where!"

JAPAN. From the American Consulate General, Seoul, Korea (Chosen), Miss Eliza R. Scidmore, collaborator, reports as follows on Japanese beans and bean candies and jellies:

As mameya or bean shops, are more numerous in the streets

of Japanese towns than shops of any other kind, it proves that this vegetable is the most common and popular single article of food after rice. It is also much cheaper, and besides being recognized as a strong or nourishing food, it is considered a good luck food. If eaten at the first meal of the day, and on the first day of the year, the lucky beans will ensure strength and good luck for the day and the year. From the beginning of the modern era the people have been exhorted to grow and eat more beans and less rice. It was the Japanese who first appreciated the value and the trade possibilities of the more prolific soya bean of Manchuria and developed the great export trade in that article.

Eighteen kinds of mame are sold in the large wholesale shops, many of them varieties and qualities of the same bean. Dried peas are classed with beans and sold in the same shops, and are also cooked with sugar and sold as sweets. Besides cooking them with sugar and sweet shoyu, the boiled beans are made into neru, or sweet paste, and yokan or jelly, which are the base of three-fourths of all the sweets sold by confectioners.

The small red adzuki bean (S. P. I. No. 34643) is the one most used for these pastes and jellies, the white adzuki (S. P. I. No. 34644) only affording a color contrast and serving as a medium for other color devices. The plebian word mame is never applied to the adzuki. One asks for and refers to adzuki only. Three qualities are sold, the largest and reddest selling at about .15 U. S. cents for a measure equalling our quart. The medium quality, selling for about .10 cents a quart, is mostly used by confectioners. A meal or flour of ground and sifted adzuki is made but it is not used by the confectioners. The adzuki meal is most often used for making a soup or hasty pudding which is considered a valuable morning food for invalids, the aged, and delicate children. Much color and flavor is said to lie in the husks or thin shells, and this is lost by the use of the bolted meal. The "red rice" of festival occasions, the New Year, marriage feasts and other ceremonial events, is made by adding the rice to the water in which adzuki are already boiling and cooking them together.

For neru, or bean paste, adzuki are washed and boiled in large copper pans, the water twice changed in the half hour and each time as deeply dyed. When the adzuki are soft enough to press away between the fingers, the mass is thrown in a hopper and ground to break the skins which are removed by rubbing through a sieve. The pulp is pressed in a bag to expel all the water and cooked again with sugar, beaten and stirred all the time with a big paddle. This dark, red sweet paste which tastes something between maple sugar and candied chestnuts is most commonly met as balls or dumplings encased in a thin tough shell of soft rice paste. Glutinous rice flour is

mixed with yama imo, or nagai imo, wild or long potato, which when grated gives a foamy, ropy cream and is all the liquid needed to make a thick dough. Rounds of this well kneaded dough are deftly worked over a ball of bean paste and the dumplings are steam cooked in wooden trays. The thin tough rice membrane holds the paste in any shape it is moulded to and is a surface easily tinted or worked upon with relief devices. The dumplings are very often flattened out like muffins and toasted a rich brown which deceives many a stranger.

Yokan or bean jelly is made by adding kanten, a gelatine derived from sea weed, to the sweetened paste with a little water. It is poured into wooden boxes to cool and cut into slabs eight inches long and two inches wide, wrapped in dry bamboo husk and sold in thin wood or paper boxes. Neither the bean paste or the jelly will keep for any time, the yokan soon crystallizing on the outside and in time drying as hard as a stone in cold weather, or moulding in hot weather. Bits of candied chestnuts are sometimes added to yokan and there is kuri yokan made entirely of chestnuts, which costs three times as much as the plain bean yokan, but is warranted to keep for a long time. O'cha yokan is white bean paste strongly flavored and colored with powdered green tea leaves; and there is a kake yokan, a bright orange yellow jelly made of fresh persimmons with a little of bean paste and kanten gelatine. These tea and persimmon jellies are specialties of the Uji tea district and of Ogaki and Gifu and are attractively offered for sale at those railway stations in sections of split bamboo stem into which the jelly is poured to cool.

Adzuki are toasted or popped as we treat our dwarf Indian corn, but the grains do not open so widely. They are eaten merely toasted or they are salted or sugared over, or welded into an adzuki brittle with a syrup of ame (barley honey).

Kuro mame, (S. P.I. No.34645) or black beans, are made into paste and also yokan, in the same way as the adzuki. Kuro mame boiled with a little soda to soften their obdurate skin, with a pinch of salt and a big pinch of sugar added, after the water is poured off, are a favorite relish with flesh or fowl, and are always found in one corner of the dainty bento or luncheon box sold at railway stations. These kuro mame are more particularly the good luck bean than any of the others, and are a necessary accompaniment of the New Year feast.

The tender young Sora mame (S. P. I. No. 34646) are the favorite beans for popping. None of these toasted or popped beans foam out into the great white starchy kernels like pop

corn. The beans split only enough to show the white heart. They are quite solid and hard but if held in the mouth for a few minutes become soft. The sora mame have a sweetish taste and when cooked as a vegetable are further sweetened with sugar. Many of these beans seem naturally more sugary than the sugar beet.

When the sora mame is fully grown it becomes the big flat Ota Fuku (S. P. I. No. 34647), a huge bean with a tough olive skin that has to be removed by scalding with wood ashes before it can be cooked at all. Sugar or sweet shoyu are usually boiled with it when served as a vegetable. They are also popped and they are so very hard that it requires several minutes steaming in the mouth before the teeth can make an impression. In view of this hardness and the great food value of these large beans, it would be interesting to know if toasted ota fuku beans would not be as useful to the pedestrian and mountain climber as the traditional raisin held in the mouth, or the compact piece of chocolate.

Shiroi Endo (S. P. I. No. 34648), Aoi Endo (S. P. I. No. 34649), and Aka Endo, (S. P. I. No. 34650) are classed as beans, used as such and sold at bean shops, but are peas named for their distinguishing colors - white, blue and red. All three are sold toasted, and they are boiled and coated with sugar in several colors and become the favorite sweet of the children, who get a half pint of go-shiki-mame (five-colored-beans) for a penny. The aka endo, as brightly red as adzuki, are often boiled in sugar and used to decorate and encrust balls and cakes of bean paste or rice dough.

To Roku mame (S. P. I. No. 34651), which is a white bean the size of a small lima bean, gets its name To (10) Roku (6), because ten such beans laid in a row equal six sün or Japanese inches. It is boiled and rolled in sugar and is a very satisfactory sweet for the tea tray.

Shiroi daidze (S. P. I. No. 34654), the commonest and cheapest of all Japanese beans, is most used for the manufacture of tofu, or bean curd, and for shoyu, the pungent fermented sauce that we know as Worcester sauce when treated to capsicum and other hot spices. Shiroi daidze is used to make a cheaper white bean paste. This bean looks like a dried pea, but when soaked for even an hour in water it elongates to an oval bean. It is suspected that this bean is used in the manufacture of the many unsweetened brands of condensed milk, the taste of raw beans being unmistakable in all brands. Also, the milky fluid resulting from the first maceration of the beans for tofu was thrown away as useless until a few years ago, when a chemist discovered that it had the same chemical qualities as milk and all its nutritive value. Since then, the tofu factories have regularly made and sold "artificial milk", made by a process patented five years ago by Mr. Shugo Takano, a graduate of the Tokyo Bacteriological Laboratory.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 83.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

December 1, 1912, to January 15, 1913.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Acacia	34837-838	Ilex	34836
Alicastrum	34876	Kennedya	34842
Aristoclesia	34878	Lagunaria	34843
Boronia	34839	Nicotiana	34820
Carica	34903	Persea	34855-856
Cassia	34809		34904
Chenopodium	34823	Phaseolus	34888-900
Cydonia	34864	Solanum	34866
Dioscorea	34861	Sterculia	34873
Gnaphalium	34819	Stevia	34883
Grevillea	34872	Vigna	34859

PLATE: The Simmonds Papaya.

UNITED STATES DEPARTMENT OF AGRICULTURE.
BUREAU OF PLANT INDUSTRY.
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 85.

BULLETIN OF NOTICES NEW INTRODUCTIONS.

December 1, 1913, to January 15, 1913.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this OFFICE. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS BULLETIN.

Agosta	34857-878	Ilex	34876
Allosetrum	34870	Kennedya	34842
Artocarpus	34872	Leguminosae	34843
Borassus	34879	Miscellaneous	34850
Cactus	34865	Persea	34855-876
Canna	34869		34884
Chenopodium	34858	Phaseolus	34878-900
Cydonia	34864	Solanum	34866
Diospyros	34861	Stercullia	34873
Eucalyptus	34819	Stevia	34885
Oravilla	34872	Vigna	34859

PLATES: The Simmonds Papaya.

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

ACACIA ELATA. (Mimosaceae.) 34837. Seeds of cedar wattle from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemain, Victoria. A New South Wales tree of very local distribution, furnishing small quantities of lower grade gum arabic. It is an evergreen tree with pale yellow flowers growing to a height of 60 to 80 feet. For distribution later.

ACACIA SPECTABILIS. (Mimosaceae.) 34838. Seeds of the mudgee wattle from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A yellow-florwered evergreen shrub eight to twelve feet in height. For distribution later.

ALICASTRUM SP. (Moraceae.) 34876. Seeds of the "ramon" from Merida, Mexico. Presented by Mr. G. N. Collins, of this bureau. "A small tree common in northern Yucatan, the branches of which are the principal fodder during the dry season. All kinds of animals seem to eat the leaves freely. The plant is strictly tropical, and I do not know that it could be grown anywhere in the United States, but it was so extensively used and seemed to afford such excellent forage in the dry regions of Merida that it might be worth while to give it a trial." (Collins.) For distribution later.

ARISTOCLESIA ESCULENTA. (Clusiaceae.) 34878. Seeds of the pacuri from Villarica, Paraguay. Presented by Sr. Carlos Mahaux. "A very large beautiful tree with hard wood. The leaves are coriaceous, and elegantly marked with numerous parallel veins; the flowers are large, of a light red color, solitary at the ends of the small branches. The fruit called pacoury-uva in Brazil, is said to be very sweet and delicious. Whilst the seeds have the flavor of almonds." (Lindley, Treasury of botany.) For distribution later.

BORONIA PINNATA. (Rutaceae.) 34839. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A pink-flowered evergreen shrub 4 to 10 feet high. For distribution later.

CARICA PAPAYA. (Papayaceae.) 34903. Seeds of papaya from Merida, Mexico. Presented by Mr. G. N. Collins, of

MATTER IN THIS BULLETIN IS NOT TO BE PUBLISHED WITHOUT SPECIAL PERMISSION.

ACACIA MEARNSII. (Mimoseæ.) 34857. Seeds of black wattle from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemain, Victoria. A tree 30 to 40 feet high, with dense foliage of dark green, finely divided leaves. Very hardy and drought resisting. Succeeds in poor soils. Valuable for tanning purposes. For distribution later.

ACACIA SPECTABILIS. (Mimoseæ.) 34858. Seeds of the mudgee wattle from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A yellow-flowered evergreen shrub eight to twelve feet in height. For distribution later.

ACACIA [illegible] (Mimoseæ.) 34876. Seeds of the [illegible], Mexico. Presented by Mr. G. N. [illegible], of [illegible]. "A small tree common in northern Mexico, the branches of which are the principal fodder during the dry season. All kinds of animals seem to eat the leaves freely. The plant is strictly tropical, and I do not believe that it could be grown anywhere in the United States, but it was so extensively used and esteemed to afford [illegible] forage in the dry regions of Mexico that it [illegible] worth while to give it a trial." (Collins.) For [illegible] later.

ACACIA [illegible] (Mimoseæ.) 34878. Seeds [illegible] from Victoria, Australia. Presented by Dr. Charles Bonnet. "A very large beautiful tree with bark [illegible]. The leaves are coriaceous, and elegantly marked with [illegible] veins; the flowers are large, of a light [illegible], solitary at the ends of the small branches. The [illegible] called mimosary-nuts in Brazil, is said to be very sweet [illegible]. Whilst the seeds have the flavor of almonds." (Hindley, Treasury of botany.) For distribution later.

BOLBOPHYLLUM [illegible] (Rutaceæ.) 34879. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A pink-flowered evergreen shrub 4 to 10 feet high. For distribution later.

CARICA PAPAYA. (Passifloreæ.) 34903. Seeds of papaya from Jalisco, Mexico. Presented by Mr. G. N. Collins, of

this Bureau, who procured them through Sr. Arturo Zavala from the Chinese gardens. "Seeds from a very large and fine flavored fruit. The trees produce when small and are very prolific, many trees not over 7 feet in height bearing from 15 to 20 enormous fruits and of course, numerous smaller ones. The Chinese gardens about Merida are securing remarkable results with this fruit." (Collins.) For distribution later.

CASSIA OBOVATA. (Caesalpiniaceae.) 34809. Seeds from South Africa. Presented by Prof. J. Burtt-Davy, Government Agrostologist and Botanist, Pretoria, Transvaal. "Seed from the southwestern Transvaal and Bechuanaland. The root is supposed to possess medicinal virtues and the leaves are said to be used in tropical Africa as a substitute for and adulterant of, commercial senna; I have no personal experience of its merits. The plant prefers a sandy soil and grows in a region of summer rain with a 15 to 20 inch rainfall." (Burtt-Davy.) For distribution later.

CHENOPODIUM QUINOA. (Chenopodiaceae.) 34823. Seeds of quinoa from Puno, Peru. Presented by Mr. C. Bues. "Seed of a Peruvian grain. It is exceedingly nourishing and might interest breakfast food manufacturers. Grows on semi-arid land, is sown in rows and gives big crops. Adaptable strains might be selected. Grows at 10000-11000 feet altitude and even higher. Sown near the beginning of the rainy season. The plant resembles a weed very common in the States, and should not be pulled as a weed." (Bues.) For distribution later.

CYDONIA JAPONICA. (Malaceae.) 34864. Plants of the Japanese quince from Nancy, France. Purchased from Messrs. Lemoine & Sons. "Variety Incendie. Flowers very beautiful, double and perfect; petals round, perfectly imbricated, live fiery scarlet in color." (Lemoine.) For distribution later.

DIOSCOREA SP. (Dioscoreaceae.) 34861. The root of a yam from Manila, Philippine Islands. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "A superior sort of yam. I think we have never sent you this variety before; it has a very distinct habit, as to the rhizomes, from other yams, somewhat resembling the old West Indian 'yampee' in that respect." (Barrett.) For distribution later.

this Bureau, who procured them through Dr. Arturo Tavela from the Chinese gardens. "Seeds from a very large and fine flavored fruit. The trees produce when small and are very prolific. Many trees not over 7 feet in height bearing from 15 to 20 enormous fruits and of course, numerous smaller ones. The Chinese gardens about Belize are securing remarkable results with this fruit." (Collins.) For distribution later.

DASYRIA CUNEATA. (Omaphylinaceae.) 34809. Seeds from South Africa. Presented by Prof. A. Smith-Dary, Government Agronotologist and Botanist, Pretoria, Transvaal. "Seed from the Northwestern Transvaal and Bechuanaland. The roots is supposed to possess medicinal virtues and the leaves are said to be used in tropical Africa as a substitute for and adulterant of. commercial senna. I have had personal experience of its merits. The plant prefers a sandy soil and grows in a region of summer rain with a 15 to 20 inch rainfall." (Burtt-Davy.) For distribution later.

DRIMYOPHLOEUS SPECIOSA. (Chenopodiaceae.) 34835. Seeds of plants from Inner Peru. Presented by Mr. O. Pugh. "Seed of a fervelum grain. It is exceedingly nourishing and might interest breakfast food manufacturers. Grows on semi-arid land, in zone in zone and gives big crops. Adaptable, straight might be selected. Grows at 10000-11000 feet altitude and even higher. Goes near the beginning of the rainy season. The plant resembles a weed very common in the states, and should not be pulled as a weed." (Pugh.) For distribution later.

CYNORTIA JAPONICA. (Malvaceae.) 34854. Plants of the Japanese cultivars from Henry. Purple. Purchased from Kemura Yamajiya & Sons. "Variety insemble. Flowers very beautiful. Double and perfect; petals round, perfectly textured. Like fiery scarlet in color." (Semsing.) For distribution later.

DIOSPYROS SP. (Diospyraceae.) 34861. The roots of a yam from Manila, Philippine Islands. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "A superior sort of yam. I think we have never seen from this variety before; it has a very distinct habit, as to the thickness, from other yams, noticeable resembling the old west Indian 'yampee' in that respect." (Barrett.) For distribution later.

GNAPHALIUM ORIENTALE. (Asteraceae.) 34819. Plants of immortelle from Toulon, France. Presented by Mr. F. M. Mansfield, consular agent. "In growing immortelles the choice of soil is very important. Rocky or sandy soils with southern exposure, are best adapted for this purpose. In rich, deep, cold soils, the immortelle is killed by the first frosts. After the soil has been broken and well prepared, the ground is laid out in rows 16 to 20 inches apart; in these rows the young plants are set out at a distance of 12 to 14 inches from each other. Care should be taken to heap up the soil about the roots. These early plants should be watered by means of a sprinkler. If it should rain after the planting, sprinkling would be unnecessary. It would be advisable during the first four or five days to protect these young plants from the hot rays of the sun. When they have begun to grow, they should be exposed to the full rays of the sun, and during the winter protected from the cold, for the immortelle is very sensitive to frost. It is for this reason that the immortelle is cultivated at Ollioules and Bandol only in soils well exposed to the sun and upon the southern slopes. Cultivation of the immortelle is exceedingly simple. It consists in spading lightly the ground about the plant and applying a suitable fertilizer. The ground should be spaded whenever weeds spring up around the plants. As for fertilizer, it consists of oil-cakes and stable manure, which is placed about the roots of the young plants when they have attained a certain development. The fertilizer should be renewed in this region every year in October or November. The immortelle commences to yield after the second year, and continues to bloom even more than twenty years. In this region the flower is gathered in June or July. At the moment the flowers commence to open and show a small red point in the center and are of a beautiful golden yellow, they should be gathered. When the flowers have arrived at this degree of maturity, they should be immediately gathered, for they open very rapidly and lose their commercial value. After flowers have been gathered, they are exposed to the sun for drying. When dry, they are made into bouquets and hung up in dry rooms, out of reach of mice." (Mansfield.) For distribution later.

GREVILLEA BANKSII. (Proteaceae.) 34872. Seeds from Australia. Presented by Mr. James Pink, Wellington Point, near Brisbane, Queensland. "One of the most beautiful shrubs of Australia, evergreen, with red flowers and reaching a height of from 12 to 20 feet." (Pink.) For distribution later.

ORNAMENTUM HELIANTHUS. (Asteraceae.) 34819. Plants of immortelle from Tonlon, France. Presented by Mr. F. M. Hamerfield, consular agent. "In growing immortelles the choice of soil is very important. Rocky or sandy soils with northern exposure, are best adapted for this purpose. In rich, deep, cold soils, the immortelle is killed by the first frosts. After the soil has been broken and well prepared, the ground is laid out in rows 15 to 20 inches apart; in these rows the young plants are set at a distance of 12 to 14 inches from each other. Care should be taken to keep up the soil about the roots. These early plants should be watered by means of a sprinkler. If it should rain after the planting, sprinkling would be unnecessary. It would be advisable during the first four or five days to protect these young plants from the hot rays of the sun. When they have begun to grow, they should be exposed to the full rays of the sun, and during the winter protected from the cold, for the immortelle is very sensitive to frost. It is for this reason that the immortelle is cultivated at Hyeres and Bandol only in soils well exposed to the sun and upon the southern slopes. Cultivation of the immortelle is exceedingly simple. It consists in spading lightly the ground about the plant and applying a suitable fertilizer. The ground should be spaded whenever weeds spring up around the plants. As for fertilizer, it consists of oil-cakes and stable manure, which is placed about the roots of the young plants when they have attained a certain development. The fertilizer should be renewed in this region every year in October or November. The immortelle commences to yield after the second year, and continues to bloom even more than twenty years. In this region the flower is gathered in June or July. At the moment the flowers commence to open and show a small red point in the center and are of a beautiful golden yellow, they should be gathered. When the flowers have arrived at this degree of maturity, they should be immediately gathered, for they open very rapidly and lose their commercial value. After flowers have been gathered, they are exposed to the sun for drying. When dry, they are made into bouquets and bound up in dry rooms, out of reach of mice." (Mamerfield.) For distribution later.

GNAPHALIUM RAOULII. (Asteraceae.) 34820. Seeds from Australia. Presented by Mr. James Fish, Wellington Point, near Brisbane, Queensland. "One of the most beautiful shrubs of Australia, evergreen, with red flowers and reaching a height of from 12 to 20 feet." (Fish.) For distribution later.

ILEX CORALLINA. (Aquifoliaceae.)34836. Cuttings of a holly from Orleans, France. Presented by Messrs. Barbier & Company at the request of Messrs. Vilmorin-Andrieux & Co., Paris. "Among the new hollies recently introduced from China, Ilex corallina is one of the most remarkable; it is entirely different from all other hollies existing in our collections in its peculiar habit. According to Franchet it reaches a height of from 3 to 4 meters. It is a bushy shrub, smooth in all parts, with lenticular bark and glutinous buds. Its branches, long and slender, bend gracefully without being pendant; being very flexible, they are waved by the slightest breeze. Its leaves are very long, from 4 to 5 inches, and from 1 1/4 to 1 1/2 in width, are thin and rapidly become coriaceous; they are ovate-lanceolate, finely denticulate, brilliant deep green above and pale green beneath. The fruits are numerous, small, coral red, whence comes the specific name. This shrub, which is so graceful, has none of the rigidity of our hollies; it grows rapidly and does not seem dependent on the nature of the soil. It has stood our winters without injury, even as young seedlings; perhaps it is rash to present it as hardy for the north of France, but I am sure that for the climate of central France it will be an open air shrub. It will be very decorative for the cliffs of wild gardens, in large rockeries, just as it will have its place in massed effects with other species. We have grown this interesting novelty from seeds sent by Mr. E. H. Wilson, which were collected in the thickets near Mupin, central China, at altitudes of from 1500 to 1800 meters. He had already met this species the preceding year in the ravines around Ichang." (Léon Chenault, Revue Horticole.) For distribution later.

KENNEDYA RUBICUNDA. (Fabaceae.) 34842. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A twining evergreen with dark red flowers. For distribution later.

LAGUNARIA PATERSONII. (Malvaceae.) 34843. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. "An Australian tree with white close-grained, easily worked wood used for building, which grows to a height of 40 to 60 feet and to a diameter of from 1 1/2 to 2 1/2 feet. The bark furnishes a very beautiful fiber on maceration." (Maiden, Useful native plants of Australis.) For distribution later.

ILEX CORALLINA. (Aquifoliaceae.) 3486. Cuttings of a holly from Orleans, France. Presented by Messrs. Barbier & Company at the request of Messrs. Vilmorin-Andrieux & Co., Paris. "Among the new hollies recently introduced from China, Ilex coralllina is one of the most remarkable; it is entirely different from all other hollies existing in our collections in its peculiar habit. According to Fremont it reaches a height of from 5 to 6 meters. It is a bushy shrub, smooth in all parts, with tortuous bark and glutinous buds. Its branches, long and slender, bend gracefully without being pendent; being very flexible, they are waved by the slightest breeze. Its leaves are very long, from 4 to 5 inches, and from 1 1/4 to 1 1/2 in width, are thin and rapidly become coriaceous; they are ovate-lanceolate, finely dentiulate, brilliant deep green above and pale green beneath. The fruits are numerous, small, coral red, whence comes the specific name. This shrub, which is so graceful, has none of the rigidity of our hollies; it grows rapidly and does not seem dependent on the nature of the soil. It has stood our winters without injury, even as young seedlings; perhaps it is rash to present it as hardy for the north of France, but I am sure that for the climate of central France it will be an open air shrub. It will be very decorative for the edges of wild gardens, in large rockeries, but as it will have its place in massed effects with other species. We have grown this interesting novelty from seeds sent by Mr. E. H. Wilson, which were collected in the thickets near Mupin, central China, at altitudes of from 1500 to 1800 metres. He had already met this species the preceding year in the ravines around Ichang." (Leon Chenault, Revue Horticole.) For distribution later.

KENNEDYA RUBICUNDA. (Fabaceae.) 3482. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. A twining evergreen with dark red flowers. For distribution later.

LAGUNARIA PATERSONII. (Malvaceae.) 3483. Seeds from Australia. Presented by Lt.-Col. J. W. B. Field, Castlemaine, Victoria. "An Australian tree with white glossy grained, easily worked wood used for building, which grows to a height of 40 to 80 feet and to a diameter of from 1 1/2 to 2 1/2 feet. The bark furnishes a very beautiful fiber on maceration." (Maiden, Useful native plants of Australia.) For distribution later.

NICOTIANA RUSTICA. (Solanaceae.) 34820. Seeds of tobacco from St. Petersburg, Russia. Presented by the Director of Agriculture. Seeds of several strains of this species have been secured for the use of various tobacco growers interested in producing the best nicotine-yielding strains for the manufacture of commercial nicotine. For distribution later.

PERSEA AMERICANA. (Lauraceae.) 34855-856, 34904. Cuttings of avocados from Merida, Mexico. Presented by Mr. G. N. Collins, of this Bureau. From trees reported to be of unusual quality. For distribution later.

PHASEOLUS SPP. (Fabaceae.) 34888-900. Seeds of beans from Merida, Mexico. Presented by Mr. G. N. Collins of this Bureau who procured them in the Merida markets. Thirteen species and varieties of native beans. For distribution later.

SOLANUM SP. (Solanaceae.) 34866. Tubers of potato from near Guatrache, Argentina. Presented by Mr. W. F. Wight, of this Bureau. "These tubers came from near Guatrache, Argentina, where there has been practically no rain since last May. It is said the Indians eat them raw and while the taste is agreeable enough at first I can't say the taste later is particularly good." (Wight.) For distribution later.

STERCULIA QUADRIFIDA. (Sterculiaceae.) 34873. Seeds from Australia. Presented by Mr. James Pink, Wellington Point, near Brisbane, Queensland. "An umbrageous tree producing its seeds in large pods which when ripe are a brilliant crimson color containing black seeds which are sometimes eaten by children. When ripe the pods burst open and their bright crimson color contrasting with the black seeds gives the tree a very handsome and striking appearance." (Pink.) For distribution later.

STEVIA REBAUDIANA. (Asteraceae.) 34883. Seeds from Villarica, Paraguay. Presented by Sr. Carlos Mahsux. "This Paraguayan herb is of peculiar interest because of the very large saccharin content in the leaves. A tiny fragment placed on the tongue seems as sweet as a lump of sugar of similar size. Several years ago the discovery that this plant, then called Eupatorium contained a substance many times sweeter than sugar, was heralded by the press and excited the keen interest of sugar planters all over the world.

ERIOTHAMNUS MUTICUS. (Bombaceae.) 34825. Seeds of a tree from Mt. Roraima, British Guiana. Presented by Mr. H. Pittier, of Caracas, Venezuela. "Fruits 3 inches long, 2 inches thick, ovoid, tomentose, dehiscing by 5 valves; seeds numerous, surrounded by a thick, white, cottony wool." For distribution.

ERIOTHECA PENTAPHYLLA. (Bombaceae.) 34826. Seeds of a tree from Mt. Roraima, British Guiana. Presented by Mr. H. Pittier, of Caracas, Venezuela. "Fruits 3 inches long, 2 inches thick, ovoid, tomentose, dehiscing by 5 valves; seeds numerous, surrounded by a thick, white, cottony wool." For distribution.

ERIOTHECA PENTAPHYLLA. (Bombaceae.) 34827. Seeds of a tree from Mt. Roraima, British Guiana. Presented by Mr. H. Pittier, of Caracas, Venezuela. "Fruits 3 inches long, 2 inches thick, ovoid, tomentose, dehiscing by 5 valves; seeds numerous, surrounded by a thick, white, cottony wool." For distribution.

ERIOTHECA PENTAPHYLLA. (Bombaceae.) 34828. Seeds of a tree from Mt. Roraima, British Guiana. Presented by Mr. H. Pittier, of Caracas, Venezuela. "Fruits 3 inches long, 2 inches thick, ovoid, tomentose, dehiscing by 5 valves; seeds numerous, surrounded by a thick, white, cottony wool." For distribution.

NICOTIANA RUSTICA. (Solanaceae.) 34829. Seeds of tobacco from St. Petersburg, Russia. Presented by the Director of Agriculture. Seeds of several strains of this species have been secured for the use of various tobacco growers interested in producing the best nicotine-yielding strains for the manufacture of commercial nicotine. For distribution later.

PHASEOLUS SP. (Fabaceae.) 34830-905. Seeds of beans from Merida, Mexico. Presented by Mr. G. N. Collins of this Bureau who procured them in the Merida markets. Thirteen species and varieties of native beans. For distribution later.

SOLANUM SP. (Solanaceae.) 34906. Tubers of potato from near Guatraobe, Argentina. Presented by Mr. W. F. Wight, of this Bureau. "These tubers came from near Guatraobe, Argentina, where there has been practically no rain since last May. It is said the Indians eat them raw and while the taste is agreeable enough at first I can't say the taste later is particularly good." (Wight.) For distribution later.

STENOCHLAENA SUBDIGITATA. (Stenochlaenaceae.) 34875. Seeds from Australia. Presented by Mr. James Fisk, Wellington Point, near Brisbane, Queensland. "An umbrageous tree producing its seeds in large pods which ripe are a brilliant crimson color containing black seeds which are sometimes eaten by children. When ripe the pods burst open and their bright crimson color contrasting with the black seeds gives the tree a very handsome and striking appearance." (Fisk.) For distribution later.

STEVIA REBAUDIANA. (Asteraceae.) 34893. Seeds from Villarrica, Paraguay. Presented by Dr. Carlos Rubarx. "This Paraguayan herb is of peculiar interest because of the very large saccharin content in the leaves. A tiny fragment placed on the tongue seems as sweet as a lump of sugar of similar size. Several years ago the discovery that this plant, then called Eupatorium contained a substance many times sweeter than sugar, was heralded by the press and excited the keen interest of sugar planters all over the world.

The substance turned out to be a glycerine and the anxiety of sugar interests subsided." (Fairchild.) For distribution later.

VIGNA SINENSIS. (Fabaceae.) 34859. Seeds of a black bean from San Salvador, Salvador. Presented by Mr. Thomas Hinckley, American consul-general, who procured them through the Sociedad Nacional de Agricultura, at the suggestion of Mr. R.T. Ruiz. "A black pole bean so prolific as to defy comparison. It is found in its best state in the Department of Chalatenango. The best trait of this bean beside its splendid flavor is the fact that it is sown in the same hill with Indian corn at the same time the latter is being sown, and it matures with the corn, the stalk of the latter being its natural support." (Ruiz.) For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

PARAGUAY. Asuncion. Mr. C.F. Mead writes that "Plant prospects will be better in the future as within a month I shall be at work on the new constructions, one northeast from Borja to Iguazu Falls, and the other directly south from Paraguari through the Missiones. There's no telling what can be found there."

INDIA. Coimbatore. Dr. C. A. Barber, sugar cane expert, writes that he has been unexpectedly successful in raising seedling canes in India, his present crop being probably some 10,000.

SIBERIA. Tomsk. Mr. Frank N. Meyer, Agricultural explorer writes Feb. 1 that he is visiting the University there to see botanists and collectors there, after which he expected "to leave for Krasanoyarsk where a Government nursery exists where fruit trees are being cultivated. Then on to Irkutsk, then Chita and after that either to Nertchensk known for its wild crab-apples, or straight on to Harbin, from where I am only a few days distance from Peking."

CHILE. Santiago. Mr. W. F. Wight writes January 13 that he will probably be in Chile for at least two months and a half carrying on his investigations on potatoes.

MESOPOTAMIA. Tigris River. Mr. Paul B. Popence writes on Dec. 30, from the Steamer Julnar, that he has been delayed for five weeks in Bushire in the hands of the American

The substance turned out to be a glycerine and the anxiety of many interests subsided." (Patriotic.) For distribution later.

VIENA SUBMARIS. (Vienese.) $48750. Seeds of a black bean from San Salvador, Salvador. Presented by Mr. Thomas Blackley, American consul-general, who procured them through the Societed Nacional de Agricultura, at the suggestion of Mr. R.C. Ihle. "A black pole bean no particle as to duty somewhere. It is found in the bean state in the Department of Chalatenango. The best trait of this bean beside its splendid flavor is the fact that it is down in the same hill with Indian corn at the same time the latter is being used, and it mixture with the corn, the stalk of the latter being its natural support." (Ihle.) For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

ZARAGUAY. Asuncion, Mr. C.J. Read writes that "plants prospects will be better in the future as within a month I shall be at work on the new construction, one northeast from Horta to Iguazu Falls, and the other directly south from Pertegueri through the Misiones. There's no telling what can be found there."

INDIA. Coimbatore. Dr. G. A. Barber, under date of report, writes that he has been unsuccessful in raising seedling cumen in India, his present crop being probably none left.

SIBERIA. Tomsk. Mr. Frank N. Meyer, Agricultural explorer writes Feb. 1 that he is visiting the University there to see botanists and collectors there, after which he expected "to leave for Krasnoyarsk where a Government nursery exists where fruit trees are being cultivated. Then on to Irkutsk, then Chita and after that either to Vertchensk known for its wild crab-apples, or straight on to Berbin. From where I am only a few days distance from Peking."

CHILE. Santiago. Mr. W. F. Light writes January 15 that he will probably be in Chile for at least two months and a half carrying on his investigations on potatoes.

MESOPOTAMIA. Tigris River. Mr. Paul B. Popenoe writes on Dec. 30, from the Steamer Julnar, that he has been delayed for five weeks in Bombay in the hands of the American

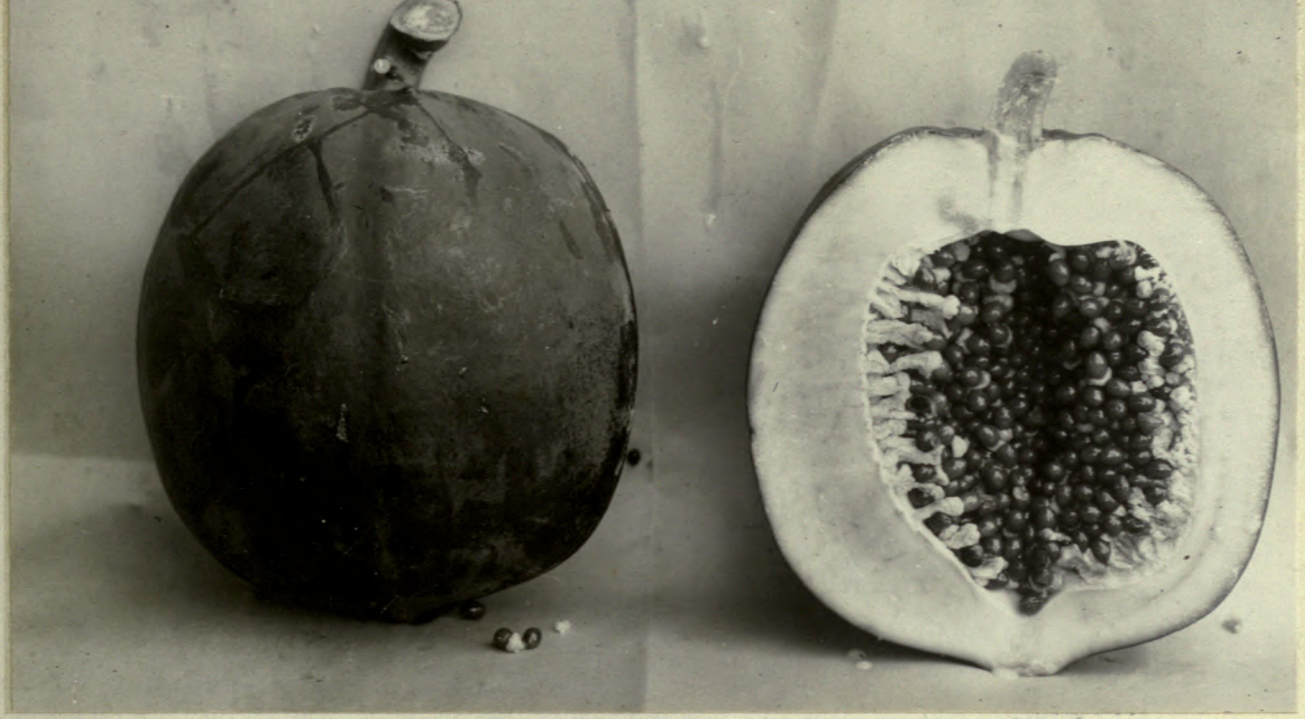
missionaries, "toying with typhoid fever," but that he is in fine shape now. "With my brother Wilson's help I was able to work up the Bushire date varieties pretty thoroughly. As you state, commercialism has kept the growers pretty well confined to a few kinds. I discovered only 30 or 35, half of them insignificant. Khadrawi appeals to me most strongly, in view of its performances in the United States, but I am importing ten or a dozen kinds, some of which will be certain to interest you. I do not know if your importation of Berki was successful, but I am getting 100 offshoots (they are scarce)for both Wilson and I agree with you that it is the best date of the region, and we think that as far as flavor alone is concerned there are few better in the world. Mr. Chalk puts 'Aweydi' ahead of it, and probably there is not much to choose, except that offshoots of the latter variety cost $2 up apiece. You may have seen this date, although you do not mention it. It is very similar to Hwezi (Hevezi). I fancy some of my Oman discoveries will interest you as much as anything. I have five varieties for instance that mature before June 15, and a new Pard that ripens one month sooner than the regular article but otherwise can not be distinguished from it. Through a friend at Bahrein I was able to get 1000 Khlasa offshoots and unless something unforeseen occurs, I believe it will be a memorable day for California date culture when they are unloaded at Indio. Wilson and I think that as a commercial date this is fully equal to the Deglet Noor (although perhaps not as a simple confectionery) and that its lighter color and attractive appearance will make it compete successfully with that date when the two are placed side by side in the open market."

more pronounced papaya flavor. Grafts from this tree will be made in accordance with the method outlined in a forthcoming Circular of the Bureau of Plant Industry and the grafted plants distributed for trial. It is named after Mr. Edward Simmonds, gardener in charge of the Field Station at Miami, Florida, in recognition of his successful work in the grafting of the papaya.

(Issued: March 15, 1913.)

missionaries, "toying with typhoid fever," but that be is
in fine shape now. "With my brother Wilson's help I was
able to work up the Bangkok date variation pretty thoroughly.
As you state, commercialism has kept the grooves pretty well
confined to a few kinds. I discovered only 30 or 35, half
of them insignificant. Whatever appeals to me most strongly,
in view of its performances in the United States, but I am
importing ten or a dozen kinds, some of which will be certain
to interest you. I do not know if your importation of Deri
was successful, but I am mailing 100 offshoots (they are
coarse)for both Wilson and I agree with you that it is the
best date of the region, and we think that as far as flavor
alone is concerned there are few better in the world. Mr.
Ghalk puts 'Awsyd' ahead of it, and probably there is not
much to choose, except that offshoots of the latter variety
cost $2 up apiece. You may have seen this date, although
you do not mention it. It is very similar to Hawai (Hawai).
I fancy some of my Oman discoveries will interest you as
much as anything. I have five varieties for instance that
mature before June 15, and a new Yard that ripens one month
sooner than the regular article but otherwise can not be
distinguished from it. Through a friend at Bahrein I was
able to get 1000 Khinas offshoots and unless something un-
foreseen occurs, I believe it will be a memorable day for
California date culture when they are unloaded at Indio.
Wilson and I think that as a commercial date this is fully
equal to the Deglet Noor (although perhaps not as a simple
confectionery) and that its lighter color and attractive
appearance will make it completely successfully with that
date when the two are placed side by side in the open market."

(January- March 15, 1913.)



THE SIMMONDS PAPAYA. S.P.I. NO. 28536.

This is a seedling from a fruit which was borne by a tree grown from seed sent in by Mr. W. G. Ross of the Panama Canal Zone in 1910 (S. P. I. No. 28536). It is the best seedling out of sixty which were grown from seed of the same identical fruit. Its globular shape, medium size and thick flesh ought to make it a good shipper and the mild flavor makes it peculiarly acceptable to those who have never eaten a papaya and learned to appreciate a more pronounced papaya flavor. Grafts from this tree will be made in accordance with the method outlined in a forthcoming Circular of the Bureau of Plant Industry and the grafted plants distributed for trial. It is named after Mr. Edward Simmonds, gardener in charge of the Field Station at Miami, Florida, in recognition of his successful work in the grafting of the papaya.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 84.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

February 16, 1913, to March 15, 1913.

NEW PLANT IMMIGRANTS.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Alysicarpus	34931-933	Harpephyllum	34943
Amygdalus	34997	Kerstingiella	34916-919
Bomarea	34979	Licania	34915
Borassus	35040	Ochna	34942
Calyptranthes	34980	Persea	34994
Caragana	34989	Solanum	35023-028
Cymbopetalum	35039		34921-922
Cyphomandra	34974	Ximenia	35043
Diospyros	34973	Undetermined	34913

PLATE: Amygdalus davidiana at Ames, Iowa.

ALYSICARPUS SPP. (Fabaceae.) 34931-933. Seeds from Poona, India. Presented by Mr. W. Burns, Economic Botanist, through Mr. C. V. Piper, of this Bureau. Three species of legumes, related species of which are considered among the best Indian grazing plants. For distribution later.

AMYGDALUS PERSICA NECTARINA. (Amygdalaceae.) 34997. Seeds of a nectarine from Santiago, Chile. Procured by Mr. W. F. Wight, of this Bureau. "Yellow-fleshed nectarines which are very common in the Santiago markets." (Wight.) For distribution later.

BOMAREA SP. (Amaryllidaceae.) 34979. Seeds from San Jose, Costa Rica. Presented by Mr. Ad. Tonduz, Botanist, National Museum. "Fruits found in the vicinity of San Jose. An ornamental with edible tubers." (Tonduz.) For distribution later.

BORASSUS FLABELLIFER. (Phoenicaceae.) 35040. Seeds of the Palmyra palm from Madras, India. Presented by Mr. H. E. Houghton, Superintendent, Agri-Horticultural Society through Mr. Jose de Olivares, American Consul. "An erect palm, 60 to 70 feet high, with a stout trunk and fan-shaped leaves, indigenous to the dry region of Ceylon, India and Africa. It is naturally suited to a rather dry climate; is extensively cultivated for the fruit and leaves. The large black fruits are borne in a cluster at the base of the leaves; the nut contains a refreshing sap, much relished as a cooling drink; the kernels or young seeds are much used as an article of food, being sold in large quantities in the bazaars during the months of April and May; the sap obtained from the flower spathes is collected in large quantities and either fermented and made into 'toddy' or 'arrack' (an intoxicating drink), or boiled down for making sugar or jaggery. The leaf blades are used for making fans, baskets, buckets, etc.; while the leaf-stalks and mid-ribs furnish an excellent brush-fibre, which forms an article of export. To obtain the latter the trees are stripped of all but three leaves once in two years. The trunk yields a hard and most durable timber and the husks are in demand for fuel. Among palms in the East the Palmyra ranks next in importance to the coconut, and the acreage under its cultivation in Ceylon is estimated at approximately 40,000 acres, while that in Tinnevelly is said to be about 60,000 acres. It is propagated from seed, which is sown in situ in holes made in sandy soil. In about ten years from sowing, the palms should be in flower, when they may be used for drawing toddy and making sugar.

When grown for fruit an average return of about 3500 nuts per acre may be obtained." (Macmillan, Handbook of Tropical gardening.) For distribution later.

CALYPTRANTHES TONDUZII. (Myrtaceae.) 34980. Seeds from San Jose, Costa Rica. Presented by Mr. Ad. Tonduz, Botanist, National Museum. "A myrtaceous fruit called Guayabillo, which yields a hard fine wood. These trees scattered throughout the praderas (country covered with meadows) are literally covered with the yellow edible fruits." (Tonduz.) For distribution later.

CARAGANA DECORTICANS. (Fabaceae.) 34989. Seeds from the Royal Botanic Gardens, Kew, England. Presented by the Director, Dr. David Prain. An Afghan shrub or small tree discovered by Dr. Aitchison in the Kurrum Valley. The bark is said to be "employed by the Afghans in the form of rings to slip over and hold the sheaths of their long knives in position in lieu of brasswork; the surface takes a good polish, and when new resembles bronzed leather." (Aitchison.) For distribution later.

CYMBOPETALUM PENDULIFLORUM. (Annonaceae.) 35039. Seeds of the ear flower from Guatemala City, Guatemala. Presented by Mr. George A. Bucklin, American Consul General. A very interesting annonaceous plant, the flowers of which when dried were used by the Aztecs to flavor their chocolate and the idenity of which has but recently been discovered by Mr. W. E. Safford of this Bureau. For full account see Smithsonian Annual Report, 1910, p. 427-431. For distribution later.

CYPHOMANDRA BETACEA. (Solanaceae.) 34974. Seeds of the tree tomato from Buenos Aires, Argentina. Presented by Mr. Carlos Thays, Director, Jardin Botanico. "An evergreen semi-woody shrub, native of Peru. The egg-shaped and smooth-skinned fruit, produced in great abundance and in hanging clusters at the ends of the branches, is in season almost throughout the year, but chiefly from March to May (in Ceylon). At first greenish purple, it changes in ripening to reddish yellow. Some varieties are of a deep-purple color. The sub-acid succulent fruits are refreshing and agreeable when eaten raw, but their chief use is for stewing; they may also be made into jam or a preserve. The tree is a quick grower, and commences to bear fruit when two or three years old, remaining productive for several years." (Macmillan, Handbook of Tropical Gardening.) Mr. L. H. Bailey found that this shrub would bear the

second or third year from seed when grown under glass, in Michigan, and the experiment is worth repeating. (Fairchild.) For distribution later.

DIOSPYROS KAKI. (Diospyraceae.) 34973. Cuttings of persimmon from Hiroshima, Japan. Presented by Rev. H. Loomis, American Bible Society, Yokohama. "Giombo. This is the variety that produces the best dried persimmons in Japan." (Loomis.) For distribution later.

HARPEPHYLLUM CAFFRUM. (Anacardiaceae.) 34943. Seeds from Cape Town. Presented by the Chief Conservator of Forests. "One of the prettiest evergreen shade trees to be seen in the gardens of Cape Town. Suitable for very windy situations and forms a very dense shade. The timber is said to resemble mahogany and is used for wagon making. The red showy drupes have a pleasant acid taste, but little pulp, and are suitable for making preserves. The tree will stand some drought and is suitable for frost-free regions. Has done well in California, and particularly well in South Florida, where trees introduced in 1902 are now 20 feet high. (Fairchild.) For distribution later.

KERSTINGIELLA GEOCARPA. (Fabaceae.) 34916-919. Seeds of the kandela from Togoland, Africa. Presented by Dr. A. Engler, Director, Botanic Garden, Dahlem, Germany. "Three years ago Professor H. Harms described a new genus of Leguminosae which he called Kerstingiella after its discoverer, Dr. Kersting of Sokode, Togoland. Apart from the strictly botanical interest attaching to it, it was remarkable as the source of a ground bean or nut which had been until then unnoticed, although its cultivation in Upper Guinea as we now know extends over a fairly large area. In 1910 Dr. A. Chevalier recorded the same plant from Dahomey, describing it as a new species of Voandzeia under the name V. poissonii. Since then it has been in cultivation and under observation in the Botanic Gardens at Dahlem and Jena, and last year Professor Harms published a short article in which he summarized briefly what was then known about this ground bean, adding some valuable information concerning the conditions of its cultivation.

"Chevalier states that Hausa traders assured him of the existence of the bean in British Nigeria. This statement is confirmed by specimens of Kerstingiella communicated to Kew by Mr. W. R. Elliot, who came across it as a field crop in Nupe. The plant is undoubtedly of some economic importance and it seems desirable to call the attention of British residents and travelers in Nigeria to the occurence

with a description of the plant and some observations of its morphological and biological peculiarities mainly quoted from the same author's earlier paper together with a list of vernacular names.

"'Two years ago I called attention to an important botanical discovery by Dr. Kersting, who, in the northern territory of Sokode-Bassari, Togoland, came across an especially interesting new kind of bean which matured its pods below, instead of above ground. The well-known ground nut (Arachis hypogaea), and the peanut (Voandzeia subterranea), are similar instances. Kersting found that the natives of Togoland cultivated the bean, which they called Kandela in three varieties distinguished by their colors. I described this bean which is not known in the wild state, as Kerstingiella geocarpa, the type of a new genus of Leguminosae.

"'In July, 1910, Aug. Chevalier, the indefatigable African explorer, reported the existence in Dahomey of a plant which, to judge from the description, was very similar to, if not identical with, Kersting's bean. He named it Voandzeia poissoni, a new species of the genus of the peanut, giving the Dahomey name as 'Doi'. the beans are sold in the market of Abomey by the natives, who grow them largely. There were also here color varieties (white, black, or red and mottled). An account may be found in Quinzaine Coloniale, 1910, No. 16, p. 590. Chevalier's description suggested at once the identity of the Dahomey and the Togo bean. M. Chevalier was, on his return from Africa, good enough to send me a specimen of his Dahomey plant whilst I supplied him with material from Togoland and our comparisons proved that the two beans were actually identical, or in other words that the Togo bean extended into Dahomey and M. Chevalier has already stated (Compt. Rend. 1910, p. 1374) that he too considers his species as identical with Kerstingiella geocarpa. He gives an important account of its distribution in Dahomey, quoting various vernacular names. The species is also said to occur in British Nigeria, but up to the present I have seen no specimen from there. In Togo as well as in Dahomey the plant is known only in the cultivated state, which renders Kersting's and Chevalier's discoveries the more remarkable.

"'Chevalier gives analyses (l.c. p. 1375) which show that the nutritious value of the beans is very considerable. They are said to equal the richest peanuts in nitrogenous matter, whilst they have at the same time a more pleasant taste, particularly for Europeans, recalling that of the finest varieties of beans. The yield, owing to the smallness of the seeds (8-10 mm. by 6-7 mm.), is not large.

In Dahomey according to the French explorer, the women are forbidden to eat the beans.

"'Last year (1910), thanks to the kindness of First Lieutenant Häring of Sokodé-Bassari (Togo), the Botanic Garden at Dahlem near Berlin received excellent seeds of this remarkable fruit. They germinated well and numerous plants were raised by Chief-Inspector F. Ledien, not a few of them flowering in July and August. A number of seeds were sent to Inspector E. Rettig of the Botanic Garden at Jena, and under his careful and intelligent treatment, splendid specimens grew up of which some even set fruit. The unfavorable and cold summer of 1910, however, prevented their maturation. The flowers are very small and papilionaceous and spring from the creeping stem close to the ground. The flowers of the variety with light or occasionally black-mottled seeds are white, those of the other varieties pale violet.

"'It is desirable to follow up the distribution of this cultivation, particularly among the natives in Togo, where it may also be found in the wild state. Similarly Voandzeia subterranea, so generally cultivated in Togo, has never been observed in the spontaneous condition. It is also possible that Kerstingiella occurs in the Hinterland of the Camaroons (Adamaua, Zola, Gerau, etc.). Chevalier states that the Hausa traders contended that it existed in British Nigeria and the probability that the Hausa people were instrumental in the spreading of the cultivation is obvious. The Hausas call it Kouarouroi according to Chevalier. It is also said to occur in Borgu. It is true, at the first glance it might be mistaken for Voandzeia subterranea and Schweinfurth actually suggests that this has been the case with certain writers (Zeitschrift d. Gesellschaft f. Erdkunde, 1910), but the expert will always distinguish them. Habit and leaves are similar and yet distinct, and Voandzeia, so long and so well known to us, has above all much larger globose seeds.

"'In any case, I should be very grateful for any communications concerning Kerstingiella or Voandzeia, their cultivation and use, and particularly if they are accompanied by flowers, fruits, and seeds. Material of this kind would enable us to establish the distribution of the plant. Kerstingiella might possibly also be grown with advantage in other parts of our colonies. Moist and hot countries do not suit it; in Togo it occurs according to Kersting in sandy laterite loam, in a climate of low humidity with occasional heavy showers and a shade temperature of 18°-34°C.'"

"As the resemblance between Kerstingiella and Voandzeia

subterranea (at least in its broad-leaved states), is considerable and the two have actually been confused, it may be useful to point out the following differences:

Kerstingiella geocarpa.	Voandzeia subterranea.
Flowers subsessile in the axils of the leaves, paired or solitary without a distinct common peduncle.	Flowers usually in pairs on a common, more or less hairy, peduncle terminating with a callous swelling.
Calyx deeply divided, with narrow, linear, subequal segments.	Calyx with short, broad and uneven teeth.
Style glabrous.	Style hairy on the inner side upwards.
Stigma terminal, capitate.	Stigma lateral, below the pointed apex of the style.
Stipes of pistil lengthening considerably after fertilization.	Pistil without a stipes.
Seeds oblong - ellipsoid, 6-7 mm. by 5 mm.	Seeds globose-ellipsoid. 1-1.5 cm. by 0.9-1.05 cm.

"The mechanism by which the pods of Kerstingiella become buried in the ground is very singular and almost unique in Leguminosae. When the flowers, which seem to be chasmogamous, are fully developed, they are close to the ground. After fertilization the solid base or stipes of the pistil, which in the flower is very short, lengthens into a carpopodium and at the same time turns towards the ground; then the corolla and the style are thrown off. The ovary, still very small, is pushed out of the calyx, and by the root-like carpopodium gradually driven into the ground, where finally the growth and the maturation of the ovary into the seed-bearing pod takes place." (From the Bulletin of Miscellaneous Information, No. 5, 1912, of the Royal Botanic Gardens, Kew, England.) For distribution later.

LICANIA PLATYPUS. (Rosaceae.) 34915. Seeds of the sonzapote from San José, Costa Rica. Presented by the Department of Agriculture. "It grows in the form of a tree, rather scarce on the Pacific coast of Costa Rica, but more common in other parts of Central America, where it is

sometimes known as Sunza. The fruit is large, somewhat oblong with a reddish-gray skin; the flesh yellowish, fibrous and rather sweet, enclosing an oval depressed seed." (W. E. Safford.) For distribution later.

OCHNA PULCHRA. (Ochnaceae.) 34942. Seeds from South Africa. Presented by Mr. J. Burtt-Davy, Government Agrostologist and Botanist, Pretoria, Transvaal, Union of South Africa. An ornamental shrub or small tree with pendulous racemes of orange-red berries, found in the vicinity of Johannesburg, Transvaal. The seeds yield oil. For frostless regions. For distribution later.

PERSEA AMERICANA. (Lauraceae.) 34994. Seeds of avocado from Valparaiso, Chile. Procured by Mr. W. F. Wight, of this Bureau. "Palta. The fruits from which these seeds were taken are sold in Valparaiso. They are purple-skinned, rather small and of very fair quality." (Wight.) For distribution later.

SOLANUM SPP. (Solanaceae.) 35023-028. Seeds and tubers of potatoes from various parts of Chile. Procured by Mr. W. F. Wight, of this Bureau. Various varieties obtained by Mr. Wight in his investigations of the potato in its original habitat. For distribution later.

SOLANUM COMMERSONI. (Solanaceae.) 34921-922. Tubers of a potato from the Colonial Museum, Marseille, France. Presented by the Director, Dr. E. Heckel.

XIMENIA CAFFRA. (Olacaceae.) 35043. Fruits from South Africa. Presented by Mr. J. Burtt-Davy, Government Agrostologist and Botanist, Pretoria, Union of South Africa. "Zuur pruin. An edible fruit useful for jellies. It grows in semi-arid, sub-tropical localities, such as the Transvaal bush-veld." (Burtt-Davy.) For distribution later.

UNDETERMINED. Roots from Angola, West Africa. Presented by Mr. Merlin W. Ennis, Boston, Mass. "Olanamba. The wild ones are found on stony mountain slopes where the soil is sandy. This cultivated root seems to thrive on any soil and will bear well on soil too poor and sandy for potatoes. The natives eat these roots raw. We bake them, use them in soup, etc." (Ennis.) For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

Mr. Frank N. Meyer, Agricultural Explorer writes from Harbin, Manchuria, Feb. 25, 1913: "The last long report I

wrote you was from Chita. I paid visits to Mr. P. M. Tolmatchoff, acting director of the local museum and arranged with him to see the botanical collections the next day. Then I hunted up a Mr. A. M. Suvari who is the Governmental Agronomist for the Chita district. This last gentleman speaks German very well and we spoke about a good many topics. The Russian Government is going to establish an experimental station near Petrofski Savod to the west of Chita, as the soil immediately around this last town is too sandy to be of any use for agriculture. Mr. Suvari himself does not know very much as yet about local Eastern Siberian conditions as his field for many years was the Steppe-territory of S. W. Siberia which he knows very well. He told me that way off of the beaten tracks one finds that in old Kirghiz settlements varieties of grains are being cultivated, like wheats, barley and millets which are quite different from any sorts he ever saw. Especially in the dry Karakalinsk district one finds them. This is to the S. W. of Semipalatinsk. Mr. Suvari also told me that the Government has intended to experiment with local wild grasses but they find it almost impossible to obtain seeds enough to work with, native people being too indolent and too dull; Mr. Suvari had offered as much as ten roubles for a tumbler full of wild lucerne-seed and not even a thimble full had been brought in. I asked about this Amur wild rice, Zizania latifolia, but Mr. Suvari did not quite know it; we have written now to the Agricultural Society at Blagowestchensk, where this grass occurs. I also went to the Office of the International Harvester Company and heard that agriculture is slowly spreading over the whole of Siberia and that more and more machines are sold every year. To obtain however, native grasses and forage plants is a thing one would have to go after himself in that short season, called late summer, which is very short indeed in Siberia.

"I saw Mr. Suvari also again, he had promised me some samples of a good rye, that grows some distance away from Chita. He had not been able to obtain it but he will send it to you at Washington. Mr. Suvari likes to obtain from us names of firms dealing in grains and forage plants from the most northern parts of America. I suggest to open up correspondence with him, especially when the Agri. Exept. Station there near Petrofski Savod will be established, as he may supply us with seeds of local fodder grasses.

"The next day I left Chita, which possesses a fine, sunny, dry winter climate, and we took our tickets to Harbin, or rather to the Sta. Manchuria, as for some reason or other they would not sell us thro' tickets, apparently in connection with delays at the Manchurian frontier. And we were delayed for many many hours, but on Friday, Feb. 21, we arrived here in this town."

AMYGDALUS DAVIDIANA. Chinese Wild Peach.

A six-year old tree of the red barked, upright strain of Chinese wild peach standing in the midst of a winter killed orchard of ordinary peaches at Ames, Iowa. This tree grown from seed of a tree now growing at Pekin (S.P.I. No. 18262) began to show unusual hardiness in 1910 and in 1911, following an unusually dry summer and stood uninjured a January temperature of -35° F., which killed the hardiest varieties of peach, such as Hills Chihli, to the ground. In Texas and southern California it has shown an unusual resistance to drouth and a remarkable earliness as a stock. It flowers very early and its buds are killed by the frost in Iowa, so that it has not fruited there. It is not an edible peach but a stock plant for stone fruits.

(Issued: May 19, 1913.)

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION.

NO. 86.

BULLETIN OF FOREIGN PLANT INTRODUCTIONS.

May 1, 1913, to June 1, 1913.

NEW PLANT IMMIGRANTS.

(Note: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

GENERA REPRESENTED IN THIS NUMBER.

Arracacia	35400
Bromus	35429
Canangium	35243
Ceratonia	35238-242
	35244-246
Citrus	35247
Corylus	35288
Cudrania	35258
Gonolobus	35249
Heritiera	35413
Ipomoea	35280-281
Juglans	35303
Lovoa	35459
Mangifera	35403-412
Medicago	35427-428
	35435-443
Mida	35323
Onobrychis	35313
Pasania	35320
Pinus	35289-294
	35300
Triticum	35314
Ziziphus	35253-257
	35260
	35416

PLATE: Fruit of Cudrania tricuspidata.

MATTER IN THIS BULLETIN IS NOT TO BE REPRINTED WITHOUT SPECIAL PERMISSION.

ARRACACIA XANTHORRHIZA. (Apiacae.) 35400. Tubers of the apio from Caracas, Venezuela. Presented by Mr. H. Pittier, of this Bureau. "This plant is cultivated in the cooler mountain districts of northern South America, where the roots form the staple diet of the inhabitants. The plant is somewhat like the wild hemlock (Conium maculatum) but its leaves are broader, its stem not spotted, and its flowers are of a dingy purple color; the roots are large and are divided into several fleshy lobes of the size of a carrot, which when boiled are firm and have a flavor intermediate between that of a chestnut and a parsnip." (Masters, Treasury of Botany.) "Here the plants grow only in the mountains above 1500 meters. I do not know whether it reaches the freezing line, but everybody says it does not thrive at lower altitudes." (Pittier). For distribution later.

BROMUS SP. (Poaceae.) 35429. Seeds of a grass from the Argentine Andes, south of Lago Nahuel Huapi. Presented by Dr. Bailev Willis, of the Argentine Survey of the 41st parallel, S. lat. This and four other grasses and a rush were sent in as specimens of the pasture grasses of this portion of Argentina. For distribution later.

CANANGIUM ODORATUM. (Annonaceae.) 35243. Seeds of the ilang-ilang from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Philippine Department of Agriculture. "A large evergreen tree of the family Annonaceae, native of Burma, but extended in culture to Java and the Philippines. An agreeable and highly valued perfume known as ilang-ilang is distilled from the flowers. It should succeed in Southern Florida and the warm portions of the Gulf Coast." (Dr. W. Van Fleet.) "The war correspondent, Mr. Creelman, called our attention several years ago to the possibility of growing this flower in Florida and shipping it to the northern markets as is now done with the Gardenia." (Fairchild.) For distribution later.

CERATONIA SILIQUA. (Caesalpiniaceae.) 35238-242, 35244-246. Cuttings of seven varieties of carob from Valencia, Spain. Presented by Mr. Claude I. Dawson, American Consul. These are cuttings of the best varieties grown in Valencia, full descriptions of which are given under S.P.I. Nos. 30914 to 30920, in inventory No. 27. For distribution later.

CITRUS SP. (Rutaceae.) 35247. Cuttings of an orange from Algiers, Algeria. Presented by Dr. L. Trabut, Service Botanique, Algeria. "This late Berna orange is the object of important export from Murcia, Spain, during the summer. The fruit is globular oval, medium in size, with very solid skin assuring its preservation." (Trabut.) For distribution later.

CORYLUS MANDSHURICA. (Betulaceae.) 35288. Seeds of a hazelnut received from Mr. Frank N. Meyer, Agricultural Explorer, Harbin, Manchuria. "A hazelnut found wild in the hilly parts of Manchuria, very resistant to cold and drought. The hulls of this hazelnut are very thick and hard while the kernels are small. The people however collect them and eat them mostly roasted and salted, and in that way they taste very good indeed. To be tested especially in the northwest plains section of the United States. Obtained on the market in Harbin." (Meyer.) For distribution later.

CUDRANIA TRICUSPIDATA. (Moraceae.) 35258. Plants from Laoling, Shantung, China. Received from Mr. Frank N. Meyer, Agricultural Explorer. "A wild shrub, sometimes growing into a small tree, found in dry places. Called by the Chinese Tcho sang, which means wild mulberry; the leaves are used for feeding silkworms in times of scarcity of mulberry leaves. This plant makes a similar impression to the osage orange but is of much smaller dimensions. Can be utilized in the drier parts of the United States as a hedge plant around gardens, as a fence material on farms, while it can also be employed for bank binding in the milder, semi-arid sections. This shrub is very thorny and can serve therefore very well for hedge purposes."(Meyer.) "Plants of this same species (S.P.I. No. 34493) introduced by Mr. E. H. Wilson, have fruited at Augusta, Ga., in the nurseries of P. J. Berckmans Sons, and the fruit is sweet and edible. It is closely related to our native osage orange (Maclura aurantiaca) and might hybridize with it. There are other edible fruited species also, so this introduction opens up a most interesting field for the breeder." (Fairchild.) For distribution later.

GONOLOBUS EDULIS. (Asclepiadaceae.) 35249. Seeds of the cuayote from San Ramon, Costa Rica. Presented by Mr. Ad. Tonduz, exploring botanist. "An asclepiadaceous twiner with yellow flowers in small racemes, and long fruits, pointed at both ends, provided with longitudinal wings. The fruit is eaten while still soft." (Tonduz.) For distribution later.

HERITIERA LITTORALIS. (Sterculiaceae.) 35413. Seeds of the dungonlate from Manila. Presented by O. W. Barrett, Chief, Division of Horticulture, Philippine Bureau of Agriculture. "A medium-sized tree with a dense crown, leaves entire, leathery, dark above and silvery beneath. The wood is very hard and durable and is classed among the best of the Philippine hardwoods. The tree is a good ornamental and makes an excellent windbreak. It succeeds on moist land and grows well even in the proximity of salt water." (Barrett.) For distribution later.

IPOMOEA BATATAS. (Convolvulaceae.) 35280-281. Tubers of sweet-potatoes from Callao, Peru. Presented by Mr. Luther K. Zabriskie, deputy American Consul. Two varieties of sweet-potatoes, one white skinned, and yellow within, with an especially sweet taste, and preferred by the Peruvians, the other a purple-skinned variety. For distribution later.

JUGLANS MANDSHURICA. (Juglandaceae.) 35303. Seeds of the Manchurian walnut from Mukden, Manchuria. Received from Mr. Frank N. Meyer, Agricultural Explorer. "The Manchurian walnut is a stately timber tree, occurring in Manchuria and Japan. It is very sensitive to late frost and on that account has proven to be a difficult tree to grow away from its native countries." (Meyer.) For distribution later.

LOVOA SWYNNERTONII. (Meliaceae.) 35459. Seeds of brown mahogany from Mount Silinda, Melsetter, Rhodesia. Presented by Mr. O. J. Omer, American Board Mission in South Africa through the Forest Service of this Department. "This tree produces a splendid dark brown wood of great strength and durability and is found only in our forest here at Mount Silinda, the only forest of large trees in Rhodesia. The tree grows to a height of 150 to 200 feet, diameter 5 to 8 feet, a 150 foot tree requiring about a hundred and fifty years for growth. It is, I understand a true mahogany, and it is because of its rarity that I thought you might take an interest in experimenting with it in America. The temperature here varies from about 30° F. in the cold season to about 80° in the shade during the summer months, rainfall 70 inches, more than half of this falling during the three summer months, elevation 5000 feet, distance to sea one hundred and fifty miles, prevailing winds from the sea." (Omer.) "It is a fact worth mentioning that other trees from Rhodesia have done peculiarly well in Florida."(Fairchild) For distribution later.

MANGIFERA SPP. (Anacardiaceae.) 35403-412. Rooted cuttings of mango from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Gardens. Nine species of mango, and one related species shipped by Wardian case, introduced in order to secure the best Javanese varieties for comparative tests. For distribution later.

MEDICAGO SATIVA. (Fabaceae.) 35427-428. Alfalfa seed from Lima, Peru. Purchased from Dr. C. H. Tyler Townsend, Chief Entomologist, Peruvian Department of Agriculture. Two forms, one from a high altitude, the other from a drier region near sea level. For distribution later.

MEDICAGO SATIVA. (Fabaceae.) 35427-428, 35435-443. Alfalfa seed from Poona, India. Presented by Mr. T. Forester Main, Deputy Director of Agriculture. Nine varieties differing but slightly from those of Western India. For distribution later.

MIDA ACUMINATA. (Santalaceae.) 35323. Seeds of the quandong from Sydney, Australia. Purchased from Anderson and Company. "The quandong, which is found in all the states of the commonwealth except Tasmania, is a beautiful evergreen tree, finally attaining a height of about 30 feet. It has opposite lance-shaped leaves, mostly two or three inches long, and rather numerous, insignificant flowers arranged on small, terminal branches. These are succeeded by globular fruits, about three-quarters of an inch in diameter, of a reddish color when ripe, and in that condition are often called native peaches. When the quandong is carrying a crop of fruit the smaller branches often become pendulous from the weight of it, and then the tree is decidedly ornamental, and produces a very fine effect in the landscape. The succulent outer part of the fruit is acidulous, but can be made into an excellent preserve and jelly having a flavor somewhat similar to that of guava conserve. It can also be used for tarts or pies, or served with cream. The outer covering, after the nuts have been extracted, may be dried either in the sun or in an evaporator. The nuts, which are called quandongs, have edible and nutritious kernels of a very pleasant flavor. They contain a large percentage of oil, which burns readily, producing a bright light. The oil can be expressed from the kernels by ordinary methods, and may eventually prove of considerable commercial importance. The trunk of the tree is not of great dimensions, for it rarely exceeds 8 or 9 inches in diameter. Its

timber is hard, not liable to split or warp, and when mature, of a yellowish color. It is easy to work, and on being freshly cut or reworked emits a pleasant fragrance. It is suitable for turnery, carving and cabinet work, and has been recommended for wood engraving. The drought-enduring qualities of established trees are remarkable, for their growth seems to be neither seriously affected by the hot winds that are periodically experienced in summer, nor by the long periods of dry weather which prevail in adverse seasons. Plants grown from seeds in nursery rows do not bear transplanting very well, for if the root system of the young seedlings is much disturbed they wil take some time to recover." (Fred Turner, in the Sydney Morning Herald.) For distribution later.

ONOBRYCHIS SATIVA. (Fabaceae.) 35313. Seeds of sainfoin from Issyl-kul, western Siberia. Obtained from Mr. I.M. Karsin, by Mr. Frank N. Meyer, Agricultural Explorer. "A native west Siberian forage plant obtained from Mr. I. M. Karsin at Issyl-kul, who believes that this western Siberian form of sainfoin is bound to play a great role some of these days as a late fodder crop in dry regions with short growing seasons. This sainfoin thrives best in a soil which contains considerable lime." (Meyer.) For distribution later.

PASANIA CORNEA. (Fagaceae.)35320. Seeds of the South Chinese evergreen oak, purchased from H. Green, Superintendent, Botanical and Forestry Department, Hong Kong. "An evergreen oak, said to be a very showy ornamental, but interesting particularly in bearing acorns as hard-shelled as the nuts of the American hickory, which contain a kernel almost as sweet as the Spanish chestnut. These acorns are sold in the markets of Canton and Hong Kong in large quantities and are keenly relished, not only by the Orientals, but also by Europeans. Although difficult to predict how hardy this species will be in America, it is worthy of trial in all regions where citrus fruits can be grown. A single specimen at my place in Maryland lived through two winters and grew slowly although the temperature dropped to 17° F. It succumbed the third winter however, although it was a very mild open one." (Fairchild.) For distribution later. For photograph see Bulletin No. 37 this series.

PINUS SPP. (Pinaceae.) 35289-294, 35300. Seeds of pines from Siberia and Manchuria. Received from Mr. Frank N. Meyer, Agricultural Explorer. Five species of pines,

some of them furnishing lumber, others suitable for ornamental planting. For distribution later.

TRITICUM DURUM. (Poaceae.) 35314. Seeds of a durum wheat from Issyl-kul, western Siberia. Obtained from Mr. I.M. Karsin, by Mr. Frank N. Meyer, Agricultural Explorer. "Var. melanopus. A valuable black-bearded summer durum wheat having the bracts close together. Selected by Mr. I. M. Karsin at Issyl-kul, who finds that in dry western Siberia, wheat with short dense ears requires less moisture to mature and are less easily injured by long droughts than wheats with long loose open ears. This variety melanopus especially needs but little moisture to ripen fully." (Meyer.) For distribution later.

ZIZIPHUS TRINERVIS. (Rhamnaceae.) 35416. Seeds from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Philippine Bureau of Agriculture. "A tall shrub or small thorny tree of vigorous growth. This species may prove a good stock for the improved varieties of Ziziphus jujuba in the tropics where this species does not succeed well on its own roots. It should be planted on well-drained land." (Barrett.) For distribution later.

ZIZIPHUS JUJUBA. (Rhamnaceae.) 35253-257, 35260. Scions of jujubes from Laoling, Shantung, China. Obtained by Mr. Frank N. Meyer, Agricultural Explorer. Several varieties, one bearing almost entirely seedless fruits, which are steamed and dried for winter use, another with fruit the size of small eggs, and a third with very sweet fruits. For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

CHILE. Santiago. Mr. W. F. Wight, writes March 29, 1913. "In regard to Chiloe, it is in large part an unknown wilderness and there is one man who can be of very great service, namely Dr. Roberto Christie, Casilla F, Castro, Chiloe, Chile. Dr. Christie knows southern Chile better than any other living man and I am sure will send us some very interesting seeds such as the Cypress of Chiloe, and many others. Through Dr Christie's help I was able to get into a region totally uninhabited and never visited by any botanist. There is on the west coast near Quilan and south of Cucao, a plant with a fruit like a Pandanus, (Dr. Christie calls it a Bromelia but it may not be) which I think may be of considerable value.

The leaves are perhaps as long as those of New Zealand flax and yield a fibre from which the Indians make a very strong rope. I saw them use this rope in ways that would severely test its strength and there can be nó doubt on that point. If any one will take this matter up and grow the plants it would be worth while to spend some money to secure it. There was no seed and young plants would have to be sent. These would have to be taken up with some earth and carried in sacks on horseback over a terrible trail for some distance, then across a lake and again by cart or on horseback to Castro, from which point they can be shipped. Dr. Christie can attend to this if you want it done. I suspect this plant is entirely unknown outside Chiloe and there are only two men who really know the way south into this region. By the way, I have a plant something like celery with edible stems and leaves. Dr. Christie thinks it the wild form of celery but that is old-world, and I found this where there is no definite knowledge of anyone's having lived for an unknown length of time, though there was once an ancient people for I found bits of pottery within 20 miles. The present Indians do not make pottery, neither have they ever been known to do so, while what I found was in the earth and was being exposed by the wind uncovering it in the hills 200 feet above the sea."

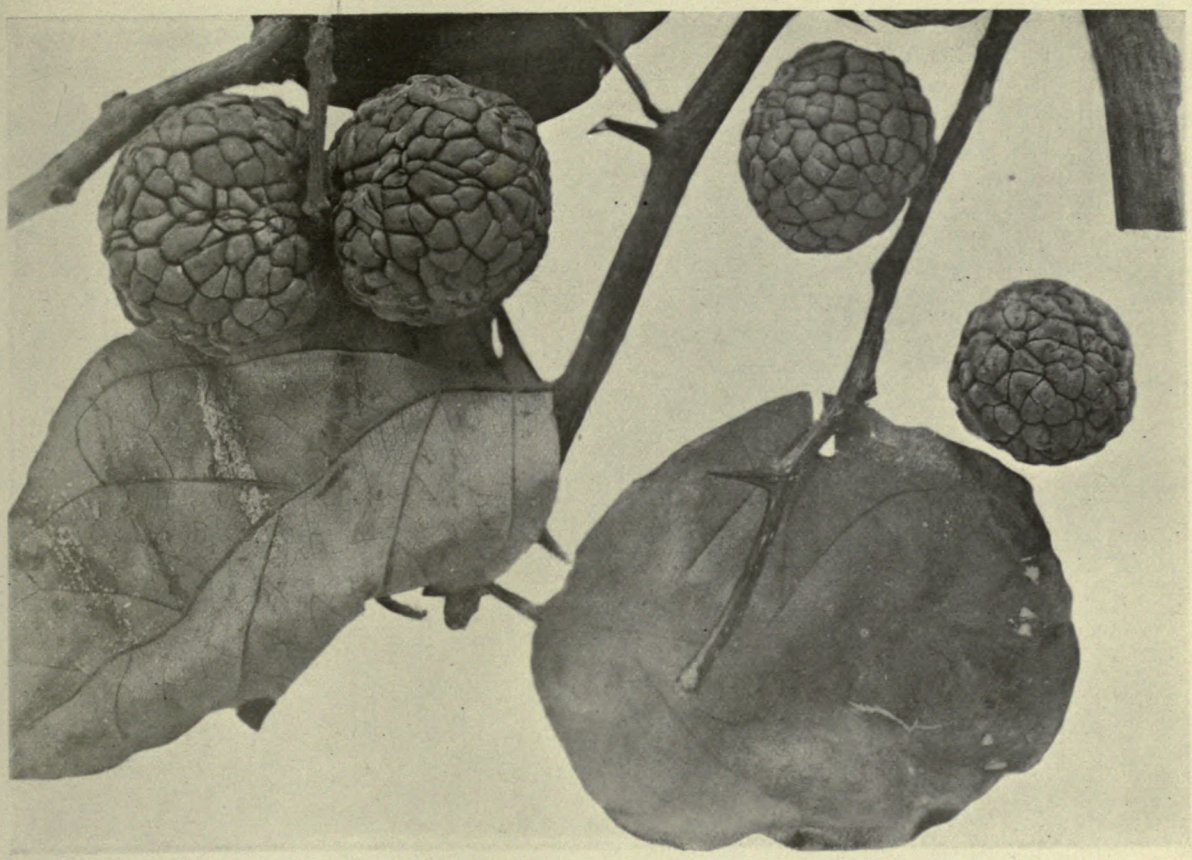
CHINA. Shantung. Tsi-nan-fu. Mr. Frank N. Meyer writes April 5, 1913. "I hope that the shipment which I am sending by post today will reach Chico O.K. and that the stocks there are not too far advanced, for there are among this lot the interesting seedless jujubes and a large fruited variety, the size of the fruit being like small hen's eggs. I have also been getting some interesting varieties of vegetables. A variety of the egg plant with large reddish white fruit, a great rarity apparently. Also some muskmelons and cucumbers. The weather all of a sudden has become very warm here and poplars and willows have already good sized leaves. The lilac, ornamental crab apple, apricot and plum are in full bloom. I am afraid that scions cannot be sent any more over that long distance to America and several things will have to be gotten this coming winter. With my present interpreter and assistant I am getting on the track of several things of which I have heard nothing before and as I probably have another two years before me here in China I suppose I will be able to bag the major part as time advances. A week or so from now I hope to return to Peking, and after having finished accounts and reports, prepare myself for

the big trip to Honan, Shansi, Shensi, and Kansu, which will last perhaps up to January, 1914, after which time I have to return again to this rich province of Shantung."

INDIA. Lahore. The Superintendent of the Government Agri-Horticultural Gardens, Mr. W. R. Mustoe, writes us April 24 "our crop of Pistacia integerrima seed is very short this year, but I shall be able to collect you a few pounds. The reason why it did not germinate with you last year was no doubt because it got too dry. Even with us it will not come up unless sown within 5 weeks after collection. We have great difficulty in keeping parrots from destroying the seed as they have a special liking for it and will clear a tree in a few days. Therefore I may have to charge you the wages of two boys for a month to watch the trees, but this will not cost more than 10 shillings."

JAPAN. Tokyo. Mr. H. Dauke writes May 2, 1913. "There are two different kinds of bean meal in this country. One is prepared from the 'Soja' bean and the other from the 'Adzuki' bean. The meal of the Soja bean, 'Kinako', is prepared by rinding the parched bean in a handmill. The meal of the Adzuki bean, 'Sarashi-an', which is mostly used in the manufacture of cakes and confections is produced in the following way. The bean is first boiled in water, and the resulting pulp then strained through a cloth bag leaving nothing but the refuse behind. This liquid is then allowed to evaporate and the solid mass remaining is ground into a fine flour in a handmill. The meal is sometimes prepared in another way. The bean is ground up in a handmill and the flour allowed to dry in the air. The meal of the Soja bean, 'Kinako' is commonly used for food in the state of flour, sweetened with sugar in covering the 'Mochi' (the rice-cake which is made by steaming glutinous rice and pounding it in a mortar). The meal of the Soja bean is often used in the manufacture of the cake called 'Mameginto' by mixing the sugar and 'Ame' (the glutinous jelly made of rice flour) in it. The meal of the Adzuki bean, 'Sarashi-an' is used in various ways. Bean meal soup is made by boiling bean meal in water, sweetening with sugar, and is served with a portion of 'Mochi', the rice cake. This soup is called 'Shiruko' and is highly relished by the Japanese. When the thick solution of 'Shiruho-an', sweetened with sugar, is boiled down it is called 'An'. It is sometimes used as a filler or an icing for the 'Mochi', but is more widely used in the manufacture of cakes and confections. Most of the cakes are made from this bean meal."

PHILIPPINES. Manila. Mr. O. W. Barrett, writes April 5 1913: "Mr. Wester is exceedingly busy at Lamao Experiment Station in building up a very large and interesting ollection of the world's best citrus plants. We are continually finding new and more or less peculiar native varieties, many of which appear to be natural hybrids, some kinds carrying two, three, and perhaps four species in their 'blood". Mr. Wester has writen the manuscript of a Citrus bulletin intended for arousing the interest of the Philippine planter in this industry which we hope will within a few years develop into one of considerable importance. I am leaving to-day for a brief visit to Mindanao. It is quite possible that I may be able to procure some interesting material for you on this trip. You will be interested to know that a new fruit from southern Palawan, discovered last year, bids fair to put the mangosteen itself 'in the shade'. None of us in this Division have seen the fruit itself, but although it is said to be a vine the leaf much resembles that of the Durian: the fruit itself is said to be on the same style as the mangosteen but is very much larger, contains more edible pulp, and the flavor is, according to report, about ten times better than that of the mangosteen. We have just one live plant but we hope to get a considerable number of the fruits in June. We have several thrifty branches of the Siamese seedless pomelo and as soon as budwood is available we shall take great pleasure in sending same to you. Mr. Boyle is much interested in the peculiar hairiness of the young shoots of this peculiar variety; the pubescence disappears after a few months but its presence is in my opinion a very distinctive point. We are still waiting for photographs and further details as to the plantation from which we received our budwood. You will be interested to know that we sent yesterday, a collector to Portuguese Timor,--at least we have first claim on all the economic material he gets there. It is claimed there are several very distinct citrus types in the East Indies. Another collector going through the interior of New Guinea promises us 'first choice'. Our banana collection now contains well over 100 'named sorts', some of which, of course, are undoubtedly duplicates. We have succeeded fairly well in raising a number of interesting African and Indian sorts from seeds. Mr. E. D. Merrill, Botanist of the Bureau of Science, promises to try to straighten out the taxonomy of Musa if we will furnish him fresh material; it seems that the recent monograph of Musa is a failure. We are continually finding wild bananas here in the hinterland of Luzon, strange Musa spp. some of which appear to be undescribed."



CUDRANIA TRICUSPIDATA.

Fruit of the Chinese Che tree, a near relative of the Osage orange, but with edible fruits, shown in natural size in the photograph. This fruit was grown at the Berckman's Nursery, Augusta, Georgia, from introductions made by Mr. E. H. Wilson, of the Arnold Arboretum, from Central China, but the plant has also been recently found and sent in by Mr. Frank N. Meyer, Agricultural Explorer, from the province of Shantung, in northern China, which has a semi-arid climate with light frosts. The striking similarity between the fruit of this species and the Osage orange suggests the possibility of making a hybrid. Photograph from fruit presented by Mr. P. J. Berckman's Nursery, Augusta, Ga.

(Issued July 24, 1913.)

P L A N T I M M I G R A N T S

Issued monthly by the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry, Department of Agriculture.

No. 89. September 1913.

Genera Represented in This Number.

Antidesma	36088	Nymphaea	36258
Artocarpus	36256	Panax	36175
Atalantia	36102	Prunus	36086, 36112
Brassica	36113	Raphanus	36115
Bunchosia	36101	Saraca	36092
Dahlia	36257	Ugni	36132, 36150-151
Eriobotrya	36210	Zea	36185-195
Juglans	36082		36197-209
Michelia	36090		36211-253

PLATE: Artocarpus odoratissimus. Marang.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

Antidesma bunius. (Euphorbiaceae.) 36088. Seeds of the bignai from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Philippine Department of Agriculture. "A small, reddish, currant-like fruit, produced on a small to medium-sized tree of common occurrence and easy culture." (Barrett.) For distribution later.

Artocarpus odoratissimus. (Urticaceae.) 36256. Seeds of the marang from Lamao, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist, Division of Horticulture, in charge of Lamao Experiment Station. "These seeds were collected in Zamboanga during my recent trip to Mindanao. This is my second opportunity to test the marang, and I have no hesitation to declare it as one of the coming tropical fruits even in its present undeveloped state. It is very sweet and rich in flavor, and has the unique quality of having a flesh that separates readily and absolutely from the seeds and the skin. As far as I have been able to ascertain the marang occurs only on the south coast of Mindanao and in the Sulu archipelago. On my return to Manila I met on the steamer a missionary that had lived in Borneo for three years, part of which time was spent in Sandakan; she had neither heard of nor seen the fruit before. The marang will probably not succeed except where the climate is warm and humid throughout the year and the atmosphere close and still. The tree is also known as madang. It is a medium-sized tree with large dark-green leaves, entire or more or less conspicuously trilobate, 18 to 24 inches long and 10 to 12 inches broad, similar in habit to the breadfruit, and is found on the south coast of Mindanao and in the Sulu archipelago, and was first described from Mindoro. The fruit is large, about 6 inches long and 5 inches in equatorial diameter, roundish oblong, regular, thickly studded with soft greenish-yellow spines about one-third of an inch in length on the outside; rind thick and fleshy; flesh white, sweet, rich, juicy, aromatic and of good flavor, separated into segments (of about the size of a grape) clinging to the core; each segment containing a seed; seeds many, whitish, one-third by three-fifths of an inch, smooth, separating readily from the flesh. When the fruit is ripe, by passing a knife around and through the rind, with a little care the two halves separate from the flesh leaving this like a bunch of white grapes. Ripe fruits were obtained in August. The marang is far superior to its relatives, the jak and the ordinary breadfruits found in the Philippines, and already in its present form is a remarkably good and attractive fruit. The tree was noted by the writer in Zamboanga and Davao." (Wester, in the Philippine Agricultural Review, November 1912, and in correspondence.) For distribution later.

Atalantia racemosa. (Rutaceae.) 36102. Seeds from Gaganbavda, Kolapur District, India. Presented by Mr. R. R. Dhavle. "A small tree or shrub, differing from the other species of Atalantia in that it is always unarmed. It is found in the lower mountain regions of Ceylon, in Southern India and in the western peninsula from the Concan to Travancore. In February the plant produces its white flowers which are arranged in short but distinct racemes with the peduncles a little less than a quarter of an inch in length. The berry is globular-ovoid, three-fourths of an inch wide with a long epiculus, four-celled, four-seeded." (Trimen, Handbook of the flora of Ceylon, and Hooker, Flora of British India.) Introduced for the citrus breeding work of the Office of Crop Physiology and Breeding Investigations. For distribution later.

Brassica pekinensis. (Brassicaceae.) 36113. Seeds of the petsai cabbage from Peking, China. "A large variety of chinese winter cabbage coming from near Tientsin, called 'Ta pai tsai.' Chinese winter cabbage is a vegetable of first class quality, having a rich flavor all its own. It is very much easier digested than the ordinary cabbage and emits no offensive odors when boiled. It can be served in many different ways and may be eaten boiled or stewed, raw, pickled or salted. To obtain the best results a rich well worked soil is needed, the plants must have a space of about two feet in all directions and they must be regularly cultivated, and they must never suffer for lack of sufficient soil moisture. The best time for sowing the seed is about the end of July or early in August; for regions with a very long summer even later will suffice. To keep them during the winter the Chinese proceed this way; after the first heavy night frost the cabbages are pulled out by a twist of the hand, the earth roughly shaken off the roots and the plants left lying on the field for a day or so to dry them off, then the outer leaves are pulled off, the dry soil beaten from the roots and the cabbages brought to dry dug-out cellars, where they are neatly stored layer on layer with the heads facing the entrance. Dry straw is now put over them and the whole covered with a heavy coat of soil. When stored carefully they last until late next spring. The roots must never be cut off as otherwise the plants begin to rot. When grown for seed the roots with just an inch or so of the leaf-stumps left on them are planted out in the spring on a special piece of land, where the soil is not too heavy. They soon form new rootlets and in a short time stalks rise up with but very scanty foliage and bearing pale yellow flowers. The process of setting seeds

takes but little time. When all goes well one has fresh seeds again in early or middle July. From the nature of the climate of north China one might predict that this cabbage will do well in those parts of America where in late summer and fall the days are warm and dry but the nights are cool and where the soil is a trifle saline and is irrigated." (Meyer's introduction.) For distribution later.

Bunchosia costaricensis. (Malpighiaceae.) 36101. Seeds of the cereza from San Jose, Costa Rica. Presented by the Costa Rican Department of Agriculture. "Fruit of medium quality and in no way comparable with the true cherry (cereza) of Europe. The tree is indigenous and often cultivated in gardens. The fruit is often called tereza, which is but a corruption of the name cereza." (Pittier, Plantas usuales de Costa Rica.) For distribution later.

Dahlia sp. (Asteraceae.) 36257. Seeds of a wild dahlia from Contreras, Federal District, Mexico. Presented by Mr. William Brockway, Superintendent Hotel Imperial gardens. "From information given me by Prof. Pringle, who collected extensively for many years in Mexico, I am led to believe that the wild dahlia growing on both sides of Ajusco mountain along the line of the Cuernavaca division of the Mexican National Railway is the variety from which the cultivated dahlias were originated. They grow at an elevation of about 8000 feet, and during the dry season these plants dry down and commence their growth again about June 1, flowering about the month of September, although I have several specimens growing in my garden that are now beginning to flower in July, having been irrigated a little. All the varieties I have noted here are single flowered and none inclining to the cactus type. I have found at least twenty colors and note some tending to the collarette type, that are mostly self colors ranging from various shades of red through orange, lemon and violet to white. Some varieties are of very robust growth mostly growing to a straight single stalk, branching out on all sides exactly like a young specimen fruit tree. They are very floriferous and I have often dug clumps of a mass of tubers that would weigh up to 10 pounds. Several of these varieties would prove of value on account of the size, strength and beauty of the full grown plant." (Brockway.) For distribution later.

Eriobotrya japonica. (Malaceae.) 36210. Cuttings of a loquat from Rome. Presented by Dr. Gustav Eisen, San Francisco, California. "Apple loquat from Boscotrecase.

It is very early as it matures in Rome in May. It is only a week later than the pear loquat, and must be classed as one of the very early desirable fruits." (Eisen.) For distribution later.

Juglans regia sinensis. (Juglandaceae.) 36082. Walnuts from Tientsin, China. "Chinese walnuts coming from Changli, Chili province, north China. Obtained through the efforts of the Hon. Samuel S. Knabenshue, American Consul-general at Tientsin. These Changli walnuts have erroneously been called Manchurian walnuts by some people because they come from near the Great Wall and this nomenclature has given rise to newspaper reports that fine walnuts were grown in Manchuria. There is however a wild walnut in Manchuria, *Juglans mandshurica*, which grows into a stately tree, of which the wood is valuable, but the nuts are not fit for human consumption. From preliminary experiments it seems that these North Chinese walnuts are of a decidedly hardier nature than the forms which occur in western and southern Europe and in north-western Asia." (Meyer's introduction.) For distribution later.

Michelia champaca. (Magnoliaceae.) 36090. Seeds of the champac from Lal Bagh, Bangalore, India. Presented by the Government Botanic Gardens, Lal Bagh, through Mr. F. W. Popenoe of this Office. "This is a tall, handsome evergreen tree, known under the vernacular name of champac. Its flowers are pale yellow and very fragrant. It may be of value as an ornamental tree for extreme southern Florida." (Popenoe.) For distribution later.

Nymphaea stuhlmanii. (Nymphaeaceae.) 26258. Seeds of a water-lily from German East Africa. Presented by the Usumbwa company, Nyembe-Bulungwa, Port Tabora. A tropical water-lily with sulphur-yellow flowers, having orange-yellow stamens and yellowish green sepals, the flowers being from 4 to 6 inches across and very sweet scented. Introduced for breeding purposes at the request of Mr. E. D. Sturtevant, the breeder of water-lilies. For distribution later.

Panax quinquefolium. (Araliaceae.) 36175. Seeds of ginseng from Songdo, Korea. Presented by Mr. C. H. Deal, Anglo-Korean School, at the request of Mr. Noble, of the Northern Methodist Mission in Korea. "This is perhaps the most famous section in the whole world for the cultivation and production of ginseng. A few years ago its cultivation dropped out but now if anything it is being cultivated more widely than ever. These seeds are fresh and as yet are not thoroughly dried. As you know when they are

dry they are very hard, so hard that they must be soaked in water until thoroughly wet and planted where they will freeze so as to burst open the shell." (Deal.) For distribution later.

Prunus tomentosa. (Amygdalaceae.) 36086. About 42000 seeds of a bush cherry from Tientsin, China. "A fruit, eminently suited for the home garden in the colder, semi-arid sections of the United States. The Chinese most times bud or graft this bush-cherry on the remarkably thrifty wild peach *Amygdalus davidiana*, on which stock it takes a much more vigorous growth and is also better able to withstand drought and adverse conditions than when left on its own roots. Chinese name 'Ying tau'r'." (Meyer's introduction.) For distribution later.

Prunus triloba. (Amygdalaceae.) 36112. Seeds of a flowering plum from Pekin, China. "A flowering plum much cultivated in the gardens of north China and existing in a great many varieties. The color of its flowers ranges from pale pink to a dark violet-rose, while as regards size, degrees of doubleness, profusion, difference in time of opening and in the lasting qualities a very great variation exists. The Chinese in the north always graft or bud this flowering plum on the wild peach (*Amygdalus davidiana*.) This is mostly down low in the ground but one also finds specimens budded high up and trained as standard trees. In this way a specimen looks fine when planted in a formal courtyard. This flowering plum is also a great favorite with the Chinese for forcing and thousands of dollars worth of them are disposed of every winter. The few fruits that these bushes bear possess no value, being the size of a cherry and having a large stone covered with an inedible hairy skin of a yellowish-red color when ripe. This shrub is much recommended for ornamental purposes all over the temperate parts of the United States and especially for the drier sections when grafted on *Amygdalus davidiana*. For forcing purposes when budded on this stock it may give surprising results for earliness. The Chinese name is 'Yu ye mei hua' which means 'Elm-leaved flowering plum.'" (Meyer's introduction.) For distribution later.

Raphanus sativus. (Brassicaceae.) 36115. Seeds of the Chinese winter radish from Peking, China. "A fine variety of the long, green winter radish called 'Ching loba.' Especially recommended for its stomachic properties. As a winter vegetable, especially for those doing hard manual labor, this Chinese winter radish will be of inestimable

value and special effort should be made to make the American public acquainted with it." (Meyer's introduction.) For distribution later.

Saraca indica. (Caesalpiniaceae.) 36092. Seeds from Lal Bagh, Bangalore, India. Presented by the Government Botanic Gardens, Lal Bagh, through Mr. F. W. Popenoe of this Office. "One of the handsomest of Indian ornamental trees, producing large heads of the most brilliant scarlet flowers imaginable. While restricted to the tropical sections of India, it may be sufficiently hardy to succeed in south Florida." (Popenoe.) For distribution later.

Ugni molinae. (Myrtaceae.) 36132, 36150-151. Seeds of the murta from Chile. Collected by Mr. W. F. Wight of this Bureau. "'Murta' or 'Murtilla.' A shrub 4 to 8 feet high with rather ornamental foliage, but esteemed in Chile for its berries which are from one-fourth to one-half inch in diameter and very palatable. They are often gathered and sold on the market in various towns, and a 'dulce' is made from them that is considered excellent. No attempt has so far been made to cultivate this shrub in Chile, but by careful selection no doubt the size and quality of the fruit could be improved and something of value developed. It is rather widely distributed, growing in the region of dry summers as well as in Chiloe." (Wight.) For distribution later.

Zea mays. (Poaceae.) 36185-195, 36197-209, 36211-253. Seeds of corn from Peru and Bolivia. Collected by Mr. W. F. Wight of this Bureau. Sixty-six varieties of corn from La Paz, Arequipa, Cuzco, etc. For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

Egypt. Cairo. Mr. S. C. Mason writes September 29: I reached Cairo yesterday morning after an absence of 18 days on a trip to Sudan. As the Sudan government is in most matters very distinct from Egypt, I found it necessary to act through our consul and the Sudan agency in Cairo, who sent me direct to Khartum, from which point all Sudan officials had been notified of my coming, so I was in receipt of every official and personal courtesy from the time I reached the Sudan border, even my start from Cairo and the changes from train to boat being made comfortable. Berber I found had been so decimated by the Mahdi that it was not worth while to stop there. As I had to await train day to get into Dongola I went one day up the Blue Nile to Tayiba where they operate a government

farm for testing Egyptian cotton growing. This Gaziera country between the two Niles is an ancient flood plain or delta formed by the two rivers at flood before the Shabluka Gorge was cut down to the present level.

The Sudan government is allowed to divert "flood water" July 15 to February 15 onto this land. They have a big steam plant now, but appropriations for a weir up the Blue Nile that will give the head for the whole region. A few years of experiment shows 500 to 800 pounds lint cotton to the acre produced at very low labor cost. The crop is planted *after* July 15 and as I saw it made a fine showing over very large tracts. With a great development, whether the same low priced labor conditions will prevail is, of course, the vital question. With the immense grazing areas in the back country, it looks as though stock feeding and cotton producing rotations might be developed that would keep up the quality of land and make this, as Khartum people claim, a second Nile delta, with cheap transit via Port Sudan and the Suez. If this proves true this country will become an enormous factor in the fine cotton problem of the world.

The Dongola province is the great date-producing region of Sudan, but they claim that all their important varieties come from the Succote country, a rather small section below Kerma, now in Halfa province for administration; that is the source for offshoots for purchase as the Dongola people will not sell but are increasing their area as fast as they can.

They have four important kinds: (1) Barakawa, a long, slender, very hard, dry date which comprises nine-tenths of all their trees. The fruit is said to keep two years and is largely sold to the desert tribes. (2) The Gondala is a smaller and softer date, yellow before ripening, which dries well, but is rich and softer, and sometimes sold in Cairo by special contract, a date well worth planting. (3) The Kulma or Kosha, a large brown date, soft and rich, reminding one of the Tafilelt, but with a good deal of tough rag, the most rare variety. (4) The Bentamouda, the prize of the lot, which will take place with the Deglet Noor and ahead of Menakher. Only men of consequence have a few trees of this variety and the fruit is kept for special festivities and for distinguished guests. These men do not sell their offshoots but they are highly esteemed gifts, though a few can be bought in Succote country, and a very reliable Shiek promises to get me a supply in February. I did not try getting in there, in fact, it is doubtful if they would have put me in, as a Camel Corps is being sent out now to form near Dongola to repel raiders from the back country armed with rifles

captured from the Italians. These people move offshoots in the late summer, setting them out at once. Their time to take them off is February, if they have to go a long distance. By agreement with the governors of Dongola and Halfa, aided by the old Shiek, a supply of all these varieties will be secured then and Brown has a very well trained man who will go down there for them. I can learn of no date called "Succotah." It must be one of these four varieties, taking the name from having come from the Succote country. Mr. Brown does not know its true characters.

This "Bentamouda" or "Bintamoda" may be the "Bartamoda" which Aaronsohn found a few of at Assouan. Gondala has been brought down there from the Succote country. From the fact that the name Barakawa does not appear in any list and is the great export date, first of Succote, then of Dongola, I am of the opinion that the date of Aaronsohn's list, S.P.I. number 32713, may prove to be this variety. The twenty offshoots secured, 10 Bentamouda and 10 others, will be planted by Brown till spring, when we will send them on with the lot to be cut in February. They came in fine condition. I am debating whether to go into Dakhla Oasis where Mr. Brown thinks the true Sultani comes from. It will take a five days' camel journey from Khargeh, the end of the branch railway. Birket el Haggi is only a district, the variety is Hayany, which with Zaglool and Samani are dates adapted to a much cooler climate and are grown along the shore dunes near Ramleh, Edkou and Rosetta *without irrigation*. They should be best suited to Phoenix and Tempe, and perhaps succeed at Santa Barbara and San Diego, California.

Egypt. Dakhla Oasis. Prof. Mason also writes, October 15; "This is about as far into the real desert as I expect to address a letter from. I find that the long arm of the Egyptian-English Government reaches here in a mild form, but one which affords a weekly camel past, so can start this word toward the Nile in the morning. This is the Capital of the oasis and the seat of a court, has a Government doctor here and so on.

We left the hotel in Kharga Saturday at 6 A. M., mule trolley over the narrow gauge to Kharga whence we took the camels. I have a very good English speaking Egyptian in charge who lived here for two or three years in the employ of the "Company" and knows nearly every one. We reached the first water yesterday about 2 P. M. and spent the night there, came in here with the guide and one baggage camel at 1:30 to-day. Not much poetry of motion about a camel on the "trot" but I have stood up to the punishment

better than I had feared or hoped. We were met here by a delegation from the chief date village, fine menn, who wanted to take us on to their town at once, but I prefer to rest till tomorrow. The great trade date is the Siady, as they pronounce it, which goes by caravan to "rail end" at Kharga. There are a few trees of Sultany reported but said to be very old and I can as yet learn of no young ones. Will send what fortune later.

What do you think of *rice* on the heaviest red adobe land, too strong in salt and alkali for barley? Some of it is now turning brown; harvest in November. It is said to have been here from Roman times. This looks to me to be the biggest find of the trip. I am arranging for a camel load of the new grain to be sent to the rail end. Expect to start back in four or five days, when I shall hope to have found Sultany offshoots."

China. Pekin. Mr. Frank N. Meyer, agricultural explorer, writes September 16: "Last Sunday night (Sept. 14) I returned here to Peking from an extended journey into the mountainous regions, West and N. W. of Peking, where I have been studying up the tree and shrub flora of the Hsiao Wui tai shan, the different varieties of persimmons, some cherry plantations and walnut and chestnut trees. As regards collecting herbarium material in Hsiao Wu tai shan, I have been quite successful, I think, for I have over *80 sp. of woody plants* in my possession now. In so far as the persimmon question is concerned I have not been very lucky, for we have a very bad persimmon year here around Peking. Sometimes trees haven't a single fruit on them. The Chinese say that the early rains ruined the flowers and no fruit was set. One grower stated there were such things as trees which bore either exceedingly little or even no fruit at all (in other words male trees). He stated however that the Chinese rebudded such trees as soon as they found out such facts. About the equatorial incision being closer to the peduncle or farther away from it, we were told that really no attention was being paid to it by anybody. The big majority of fruits (Tamopans) that I have seen however seem to have the incision closer to the peduncle than in the middle of the fruit. Of the cherries I have taken photos of the trees and collected herbarium material, that is of the sweet cherries; of the real bush-cherry (*Prunus tomentosa*) I have not seen a single good plantation on this trip. One finds it extremely difficult to obtain correct information regarding minor matters in fruits. The one Chinaman knows less than the other. The fruit dealers too

know most times not where their supplies really come from, they buy them up from here and there and everywhere and as China is the land of small doings and of everybody for himself and as almost no cooperation exists, it truly *is* hard to get exact information. On chestnuts I have to say but little, as the districts I went through possessed but very few chestnuts. I noticed however small outbreaks of bark-disease, even on isolated trees and suspect that this disease really is as old as the hills here in North China. Of walnuts we didn't see any groves like one encounters nowadays in Southern California, only scatterd trees here and there and such variation as regards quality and size of nuts. The Chinese haven't managed yet to graft the walnut, hence all trees are seedlings and therefore they all vary so much. In the Hwai lai district and right up to the Hsiao Wu tai shan, I found lots of *Medicago ruthenica* and for *grazing purposes* and *for grazing purposes only, at least for the present,* I consider this wild alfalfa much more valuable than *M. falcata*. It is specially suited for the intermountain sections of the United States and I wonder whether much attention has been paid already to this valuable forage plant. I collected only a small quantity of the seeds, but enough to grow a little plot of it somewhere. In *Kalgan* I obtained seeds of the largest variety of *Kohlrabi* in China, good sized specimens weighing as much as *25 pounds*. Some vegetable dealer ought to make some noise about this, don't you think so?"

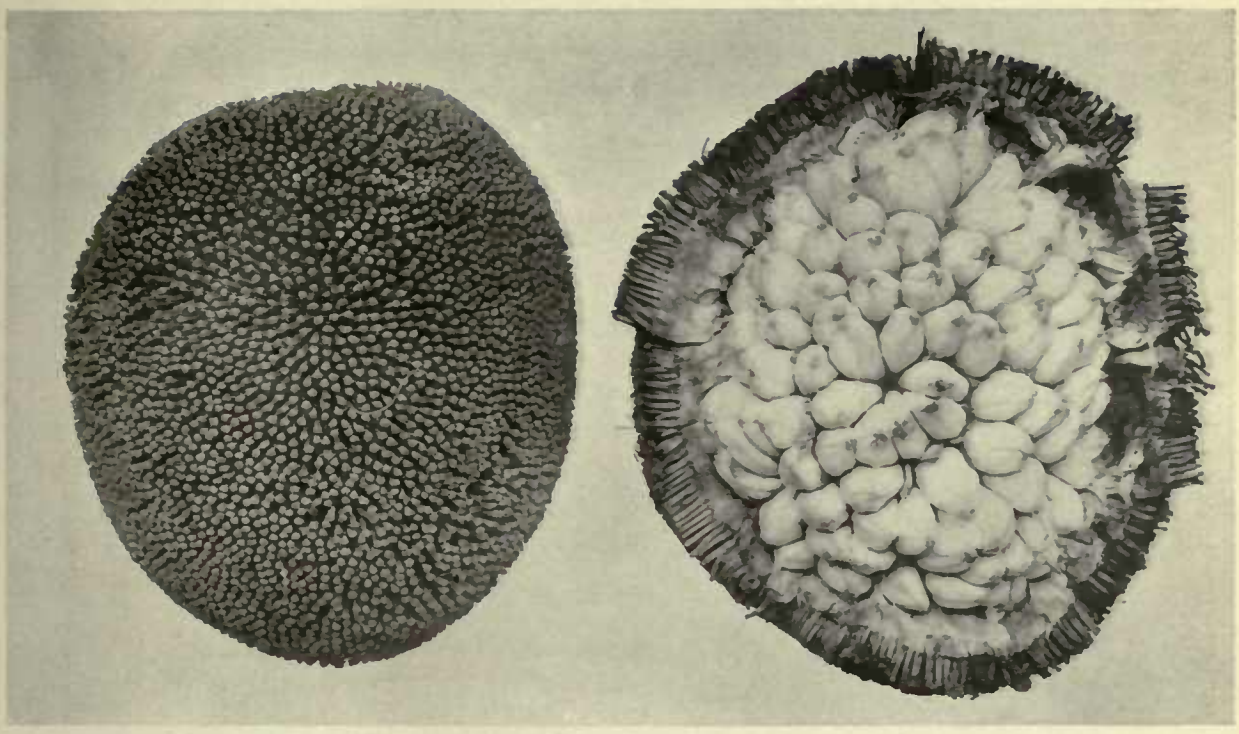
Mr. Meyer also writes under date of September 24 and 27. "I leave Peking early October 1913, by train to Honanfu, by cars from Honanfu to Sianfu, Shensi, passing through the great persimmon region of North China. From Sianfu to Lanchowfu, Kansu, passing through more persimmon districts and through jujube orchards. Returning from Lanchowfu either along the same road or by other ways, collecting cuttings and scions en-route. Back in Peking in early January. Shipping off all collections. End of January 1914, or early February, to Shantung, especially around Tsinanfu, collecting peaches, jujubes, persimmons and large fruited haws. Back in Peking toward the end of March or early April, 1914. Then making ready for a big exploration trip of the mountains and valleys of the Kansu province, starting out from Lanchow in all directions, collecting herbarium material during the summer, seeds in the fall, and scions and cuttings during the winter 1914-1915. Towards spring back to the coast and leaving perhaps by way of Japan and the Panama Canal for New York, arriving in Washington before the close of the fiscal year 1914-1915. This present winter's trip into Kansu is one

of reconnoitering more than one of thorough exploration, but as Kansu is difficult land I first want to become acquainted with local conditions before starting out on anything very big."

"In the splendid bracing autumn weather which we are experiencing here these last days I have seen several Chinamen carrying plants of the deliciously fragrant tea-olive *Olea fragrans* through the streets of the city here. These plants are all grafted on *Ligustrum sp.* (*L. sinense* or *L. quihoui?*) In the Shantung Province however they use as stock *Chionanthus retusa*, while in Central China the plant thrives on its own roots.

"Now this thought occurs to me. Our olive is a very near relative of this *Olea fragrans*, our olive suffers much here and there from frosts, from ill-drainage and from root-rot. Could not we make some extensive experiments in grafting or budding olives of various species of Ligustrum on various species of Chionanthus and on various species of Fraxinus, with the aim to make *Olea europaea* hardier, more resistant to various uncongenial factors and above all to make it more fruitful? Have also experiments been made already, for so far as you are aware, to make "standard" trees out of *Forsythia vir dissima* and *F. suspensa* by grafting it on Ashes, Fringe-trees and Privets or Lilacs, for instance on *Syringa amurensis*? Since this whole family of *Oleaceae* seems to bear grafting and budding of one species on the other so remarkably well, our office might be able to produce something remarkable along these lines. For the olive I should say the large-leaved evergreen *Ligustrum lucidum* would make a fine stock. This tree privet does well in gardens in the city of San Antonio, Texas. *Chionanthus retusa* S.P.I. 21617 might also be a good stock for same.

"We are having here a very bad persimmon year, few fruits are coming in. The growers say it was the early rains which prevented the fruit from setting and even when set, water that lodged beneath the large calyx caused the young fruit to drop. As such I have not quite been able to make out whether all fruits on a tree are exactly alike as regards the position of the incision around or whether there is a variation among them even on one tree. Yesterday I obtained some fruits from a seller and two varieties were all mixed up; one a very flat form, with the incision close to the calyx and the other, somewhat rounder, with the cut more toward the middle of the fruit."



Artocarpus odoratissimus. The marang, S.P.I. No.36256.

This remarkable relative of the Breadfruit, from the south coast of Mindanao and the Sulu archipelago, described in the text of this bulletin by Mr. P. J. Wester, who first described it pomologically, shows what horticulturists in our tropical territory may expect from a careful exploration of the less known regions in the tropics. It is described as very sweet and rich in flavor, having flesh that separates readily and absolutely from both seed and skin. The fruit is large, about 6 inches long and 5 inches across, the thich fleshy rind studded with soft greenish-yellow spines, the flesh, white, sweet, rich, juicy, aromatic and of good flavor, separated into segments about the size of a grape, which cling to the core. The ripe fruit is readily cut through the rind which may then be easily removed leaving the flesh like a bunch of white grapes. From half-size photograph, presented by Mr. P. J. Wester, horticulturist of the Philippine Department of Agriculture.

PLANT IMMIGRANTS

Issued monthly by the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry, Department of Agriculture.

No. 90. October 1913.

Genera Represented in This Number.

Amygdalus	36485	Opuntia	36350-357
Arbutus	36529	Oryza	36533
Carica	36273	Panax	36282
	36275-378	Passiflora	36361-368
Chenopodium	36304-312	Prunus	36371
Garcinia	36497	Solanum	36271
Hibiscus	36528	Triticum	36498-527
Karatas	36260		

PLATE: Perennial Rice. Oryza sp.

(NOTE: Applications for material listed in this bulletin may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.)

Amygdalus persica. (Amygdalaceae.) 36485. Seeds of a peach from the Kurram Valley, Northwest Frontier Province, India. Presented by Consul-General Henry D. Baker, who secured them from Major G. J. Davis, Commandant, Kurram Militia, Parachinar, Kurram Valley. "The Shalil grows like a peach which it much resembles, and has about the same blossom. The flesh is yellow and sweet, but it is not so juicy as that of the peach. Major Davis considers that it would be a particularly valuable fruit for cooking or canning, as the flesh being harder than that of a peach would probably not break so easily and could be more easily manipulated for such purposes. It grows at about 5600 feet elevation. The only reference I can find to the Shalil in any book I have on India is in the Imperial Gazetteer of the Northwest Province, wherein it states as regards the Kurram Valley: The climate varies. In the winter even Lower Kurram is very cold and a bitter wind prevails while in the summer it is hot and dry. Upper Kurram is never unpleasantly hot even in summer, while in winter snow covers the ground for weeks. Wherever water is available for irrigation the soil is highly productive, but owing to the absence of a settled government and the internal feuds of the people, the cultivable area is not all under cultivation, and irrigation is only carried on by small canals constructed and maintained by a single hamlet or family. Apples, pears, grapes, cherries, pomegranates, peaches, and a fruit peculiar to the Kurram and Tirah, known as the Shalil, also grow; and with improved communications fruit-growing will probably become an important industry. Famine is unknown in Kurram." (Baker.) For distribution later.

Arbutus canariensis. (Ericaceae.) 36529. Seeds of the madronho from Teneriffe, Canary Islands. Presented by Dr. George V. Perez, Puerto Orotava. "The madronho is becoming very rare here, but it is still found in the mountain ravines. It will not stand frost." (Perez.) "It is one of the most beautiful shade trees that is grown around Naples and should be tested for park and street purposes in Florida and Southern California. Its clean pink and green bark and dark green foliage make it a most strikingly beautiful object." (Fairchild.) For distribution later.

Carica papaya. (Papayaceae.) 36273, 36275-278. Seeds of papayas from Theophilo Ottoni, Minas Geraes, Brazil. Presented by Mr. Fred Birch. Several varieties of papayas, some with small seed cavities, and of excellent quality, others from so-called "male" trees, others of good keeping and shipping qualities. For distribution later.

Chenopodium spp. (Chenopodiaceae.) 36304-312. Seeds of quinoas and caneguas from Peru. Collected by Mr. W. F. Wight, of this Bureau. Eight species and varieties of this interesting Peruvian grain crop from La Paz, the Puno district and Cuzco. For distribution later.

Garcinia oblongifolia. (Clusiaceae.) 36497. Seeds from Hongkong, China. Presented by Mr. William J. Tutcher, Superintendent, Botanical and Forestry Department. A yellow-flowered tree from Southern China, related to the mangosteen, and introduced for the purpose of trying it as a stock for that fruit. For distribution later.

Hibiscus sp. (Malvaceae.) 36528. Cuttings of a new variety of hibiscus from Honolulu, Hawaii. Presented by Dr. E. V. Wilcox, Hawaiian Agricultural Experiment Station. "One of the most attractive of the new varieties, originated by Mr. V. S. Holt, and named by him Ruth Wilcox. It is a good form of shrub of free-flowering habit, and one of the few hibiscuses which emit a delicate perfume." (Wilcox, in report of Hawaiian Agricultural Experiment Station, 1912.) For distribution later.

Karatas plumieri. (Bromeliaceae.) 36260. Seeds of the curujujúl from Caracas, Venezuela. Collected by Mr. H. Pittier, of this Bureau. "One of the peculiar fruits common on the market at Caracas during the months from January to April is the curujujúl, said to be produced by the above-named species. It is a slender pod, somewhat alike in shape to a very young banana finger and of a pale greenish yellow color. Its thin skin contains a translucent fluid of syrupous consistency and very sweet, in which are imbedded the numerous black seeds. The curujujúl is very much relished on account of its refreshing qualities and its delicate perfume, being either sucked off hand or served in the form of a sherbet. It is also used in the preparation of a fine preserve. This plant grows wild in the lower belt of Venezuela; it is also planted at times in hedges. As it is, the fruit is a valuable addition to the Venezuelan fruit market, and it could very likely be improved by cultivation. The same plant is reported from Colombia, Central America and Mexico. I had previously partaken of the fruits in Nicoya, Costa Rica, where the plant is known as 'piñuela de garrobo' and in Chepo, Panama, where it is caled 'piro' but they were much smaller and of a very inferior quality. These may have belonged to distinct species. The fruits of the Mexican 'piñuela' as sold 'cooked' on the market at

Tehuantepec, are smaller, according to a natural size photograph taken by Messrs. G. N. Collins and C. B. Doyle." (Pittier.) For distribution later.

Opuntia spp. (Cactaceae.) 36350-357. Seeds of prickly pears from Peru. Collected by Mr. W. F. Wight, of this Bureau. Eight varieties from Cuzco and Arequipa, Peru, and Oruro and La Paz, Bolivia. Among them are some tunas of very good quality, and some from an elevation of 13500 feet. For distribution later.

Oryza sp. (Poaceae.) 36533. Seeds of the interesting perennial rice from the Colonial Garden, Nogent-sur-Marne, France. This is the first introduction of seeds of this species, plants of which were introduced previously under number 34092 and are now being experimented with by Mr. Chambliss of the Office of Cereal Investigations. In quality this rice is said to be superior to the annual rices of the West African coast. It may also have an unusual alkali resistance. For distribution later. See halftone.

Panax quinquefolium. (Araliaceae.) 36282. Ginseng seeds from Songdo, Korea. Presented by Mr. N. Gist Gee, Soochow University, Soochow, China. "The soil is prepared by mixing sand and loam in the proportion of 1:1. The sand is frequently obtained by sifting it from the bed of a nearby stream. In order to get as near as possible to the natural wild environments of the plant, the leaves of the oak or chestnut trees are collected, allowed to decay, and then dried. When dry the leaves are crumbled very fine, and then mixed half and half with sand sifted from the hill-side. This is obtained by first removing the top layer and getting the unexposed earth. The plants are cultivated on elevated beds about 6 or 8 inches above the pathways between them. These are usually about wide enough for one to work them from one side (about 2 or 2½ feet.) The length of the bed varies with the kind of field, short on hillside, quite long in the valley. Fertilizer one inch thick is spread upon the beds before the seeds are planted. The beds are covered over with sheds with top and one side stationary and a curtain which can roll up and down forming the other side. They seem to keep the plants sheltered throughout their entire period of growth, and regulate the amount of sunlight by the curtains. Before planting soak the seeds in water for four days until they swell and are nearly ready to burst. Then take them out and dry them. This should be done before Fall. In the Fall bury a vessel in the earth in a shady place and put the seeds as already prepared in it,

leaving it uncovered. Allow them to freeze, leaving them in the vessel until Spring. Drive nails as large as ginseng seeds in a plank, making them about 1 inch apart. Use this to plant the seeds regularly about five-eighths of an inch in depth. Place a seed in each hole and cover lightly with the hand. The rows should be about six inches apart. Spray with a very fine stream of water twice a day. Allow the planted seeds to receive the sunlight until the sprouts appear. During all of this time the beds should be protected from rains but sprayed regularly twice a day. The soil should be kept in good condition by hand cultivation after the young plants come up. This care must be constantly given to the plants. The plants are taken up at the time they are about one year old and only the best ones are saved for transplanting. Many planters do this each year for six years after the plant comes up. Others transplant and select for only the first two or three years. The plants are planted out about 6 inches apart and in rows about 1 foot apart. Care must be taken to give the two regular waterings each day during the growing seasons. (Gist Gee.) For distribution later.

Passiflora spp. (Passifloraceae.) 36361-363. Seeds of passionfruit from Peru and Bolivia. Collected by Mr. W. F. Wight, of this Bureau. Two species from Lima and Arequipa, Peru, and Oruro, Bolivia, common in the markets. "The problem of producing crosses between these fine flavored species and our Southern 'May Pop' is one which ought to attract plant breeders in this country." (Fairchild.) For distribution later.

Solanum aculeatissimum. (Solanaceae.) 36271. Seeds from Caravellas, Brazil. Presented by Mr. Fred Birch. "Seeds of the sweet hollow tomato, 18 inches to 2 feet high, forming a branched bush which is exceedingly spiny. The leaf is about the size of a medium maple leaf but shaped like those of the ordinary tomato; the skin of the fruit is tough, and scarlet in color; the flesh about three-sixteenths to one-fourth of an inch in thickness, white, granular soft and sweet; the seeds grow in a loose dry cluster in the center. Plants grown in the richest soil are much less spiny than those growing on the dry hillside." (Birch.) For distribution later.

Triticum aestivum. (Poaceae.) 36498-527. Wheats from Tashkent, Turkestan. Presented by Dr. Richard Schroeder, Tashkent Agricultural Experiment Station. Thirty varieties of spring and winter wheats concerning which Dr.

Schroeder writes: "Our Turkestan spring wheats are often sown in the late fall or in the winter and do fairly well, though our winter is rather hard. They are sown on non-irrigated land and stand drought exceedingly well, better than Durum. The most of our precipitation we get in the spring, maximum in March, the summer and fall being exceedingly dry, some years without a drop of rain. So I think that our spring wheats will not suit your southern states, nor even your central states, Kansas for instance, for they must suffer from rust in rainy summers. But in California and Utah, where they do not have summer rains, these wheats will probably be found of high value." For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

Mr. Dorsett writes from on board S. S. "Vandyck", Monday night, October 20, 1913: We are within a few hours' ride of Rio. Yesterday was rainy and a high wind. To-day has been even higher and our good ship has rolled quite a good deal. I have enjoyed it very much. We arrived in the bay of Bahia about 6 A. M. Saturday. It was not long, about 8 A. M., when the Port Doctor came aboard. A little later officials from the city came aboard to meet Colonel Roosevelt. We were advised that the ship would sail at 1:00 P. M. As our time on land was limited, we did not complicate matters by trying to get in touch with Colonel Roosevelt's party, but secured a row-boat and went ashore at once. On landing we purchased stamps and mailed our letters; then called at the office of the American Consul. He was not in. I presume had business helping to receive the Colonel. We tried to hire an auto but all were engaged, so we secured information from one of the Consul's Portuguese assistants in regard to how to get out to a *Bahia Navel Orange Orchard* at Cobulla. We took a street car for that place. It proved to be about 1½ or 2 miles out. On getting off the car we noticed to our right the way the car was running a hill several hundred feet high, upon which was an orange orchard. Prof. Hays was with us. We made a bee-line for the orchard. It proved to be a good sized *Bahia Navel Orchard*, and, as you can well imagine, Mr. Shamel was soon examining the fruit. The trees were not heavily laden with fruit, but Mr. Shamel thinks there is plenty to enable us to make the observations we want to make. We found blossoms, fruit just setting, fruit the size of pigeon eggs and fruit just beginning to change color. Mr. Shamel thinks the bulk of the crop is on in May or June. We spent about two hours looking through this orchard. We

observed what we feel quite sure is mottle leaf, gummosis, wither tip and brown rot. We also noticed several scales. After looking the field over, we thought the best thing to do would be to proceed to Rio and meet the officials there, see Dr. Willis, and spend two or three weeks in the *Library* and *Botanical Garden*; then return to Bahia and systematically study the *Bahia Navel Orange* proposition.

Brazil. Rio Janeiro. Mr. A. D. Shamel writes from on board R. M. S. P. "Alcala", November 6, 1913: We have left Rio after a strenuous three weeks and are on our way to Bahia. We had a most interesting and I believe profitable stay at Rio. It is a most wonderful city. It was a great surprise to me, a pleasant one. The combination of bay, mountains, tropical vegetation and picturesque buildings is irresistable and most fascinating.

Through an acquaintance we made on the "Van Dyck" we were given unusual opportunities for studying citrus and other tropical fruits in the vicinity of Rio. He is A. G. Foutes, a native of Brazil. He owns a fine country place and farm about 12 miles from Rio. He introduced us to a neighbor, a multi-millionaire farmer, who has an unrivaled collection of farm plants and animals. On these farms we got next to the real thing. We were given "Carte blanche" to everything on both farms, including fine dinners. We took full advantage of those conditions. In this district and in Nictheroy (across the bay) we got considerable amount of what I hope will prove valuable material, budwood, illustrations, methods, etc.

One of the most striking methods that we have found is the practise of orange growers renewing their orchards. They cut back old trees to within about a foot of the ground, allow them from one to three sprouts to grow, from which a new top is developed. A few trees in each orchard are treated in this way each year, renewing the grove as a whole gradually.

No means of combating the numerous insect pests and fungus diseases are practised. In spite of the conditions the trees are fairly productive, bearing from 200 to 500 fruits each. Considering the planting, 12 ft. by 12 ft., this means a heavy production per acre.

Oranges sell for 10 cts. apiece in Rio. Not enough are produced to supply the local demand even at this or higher prices.

No fertilizer and usually no cultivation is used. Little pruning except to cut off the lower branches so that people can walk under the trees easily. All labor is hand labor. The fruits are pulled from the trees and handled just like we handle potatoes. The loss from decay

in market is very heavy naturally. I have tried to point out these matters more fully in our notes to you under separate cover.

Through our consul, Mr. Lay, I got in touch with the leading nursery firms of Brazil. We can secure such further material, budwood, trees or plants or seeds from them by correspondence. In their citrus nursery we found a citrus tree having marvelous leaf variability. We secured budwood, etc., and I know that it will be of great value in further breeding work. The leaf mutations are as marked as our fruit mutations in California.

We have found about all the California citrus types here and many others besides. I really feel that we have been well repaid for our trip already. It has been of inestimable value to me. For one thing I have been forced to work out a satisfactory fruit and tree scoring system that will give definite and concrete data. It works like a charm.

We have found the female nematode *Tylenchus semipenetrans* but have not gotten the male yet. We have had but little daylight to devote to it so far. We found the galls and living nematodes in the galls of tomato plants. At Bahia we will have time to go into this matter carefully. If we could discover any signs of stock resistance to the nematod here, it would be a great thing. It is too much to hope for.

We are going directly back to Bahia because the trees and fruits of the navel orange should be studied now. Otherwise we should have to wait until next summer to get adequate ripe fruits for study. So we decided to return directly to Bahia and get our data. From what we saw on our way down, I believe we will hardly be able to complete our studies at Bahia before I shall have to return. There is much more material there than we anticipated or were given any reason to expect.

Oryza sp. Senegal Perenial Rice, S.P.I. No. 34092.

Two plants of this interesting newly discovered rhizome-forming West African red rice were received June 3, 1912. From these two, fourteen plants were secured by division, two of which were sent to Crowley, La., the remainder being grown in the Department greenhouses. The Crowley plants have grown well, one of them, shown in the halftone above, having spread to a diameter of about nine feet. The greenhouse material has grown to a height of over ten feet, has flowered and is still flowering, but has not set seed. Being a red rice, this perennial rice in its present form may never have any commercial value as a cereal in the United States. It is possible, nowever that this plant, may prove of great value in hybridization experiments, and it is hoped that the rhizome-forming habit may be transmitted to some of the hybrids. Photo by Office of Cereal Investigations, August, 1913. See also S.P.I. No. 36533.

P L A N T I M M I G R A N T S

Issued monthly by the Office of Foreign Seed and Plant Introduction, Bureau of Plant Industry, Department of Agriculture.

No. 94. February, 1914.

Matter in these multigraphed sheets must not be published without special permission.

Genera Represented in This Number.

Acrocomia	37382	Holcus	37114-116
Aralia	37145-152	Linum	37085-089
Aristoclesia	37384	Myrciaria	37094
Cucurbita	37132-133	Phaseolus	37078
Diospyros	37168-213	Triticum	37154
Dolichos	37081		37157
Garcinia	37381		37160
Glycine	37062-063		37164
	37074-075		37167
	37077	Vigna	37104-110
	37080	Zea	37219
	37228-325	Undetermined	37392
	37326-356		
	37396-404		

PLATES: Brazilian grasses.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Acrocomia sclerocarpa. (Phoenicaceae.) 37382. Seeds of the macauba palm from Lavras, Minas Geraes, Brazil. "A beautiful pinnate leaved species which grows wild in this region. The trunk reaches a height of 50 feet or more and is profusely covered with sharp spines, varying from 1 to 4 inches in length, and black in color. Its distribution in this part of Brazil is very wide; we have observed considerable groves at altitudes of 900 meters, which leads to the belief that it may prove adaptable to southern California. The leaves are very graceful and somewhat finer than *Cocos plumosa*. As an ornamental plant this palm should be of value. The fruit is produced in clusters sometimes weighing 30 or 40 kilos. The hard kernel is surrounded by a thick layer of white starchy material, somewhat mucilaginous in texture. Hogs are very fond of the fruits. According to Mr. Hunnicutt of the Escola Agricola, they will eat them in preference to corn, and they are said to be very fattening." (Dorsett, Popenoe and Shamel introduction.) For distribution later.

Aralia cordata. (Araliaceae.) 37145-152. Roots of the udo from Yokohama, Japan. Purchased from L. Boehmer and company. Ten of the best udo varieties from Kanagawa ken, introduced for comparison with the varieties already introduced and for selection. For distribution later.

Aristoclesia esculenta. (Clusiaceae.) 37384. Seeds from Lavras, Minas Geraes, Brazil. "From a row of trees growing in the grounds of the Instituto Evangelico. The fruit which is now ripe (January 22) is called Limao do matto (lemon of the forest) by the natives. The trees are 20 to 25 feet in height, pyramidal in form, and handsome in appearance with their deep green glossy foliage. The leaves are 4 to 6 inches in length, oblong lanceolate, acute at the apex, thick, stiff, the veins scarcely visible on the upper surface, prominent beneath. In general characteristics the fruit is almost identical with that of *Rheedia brasiliensis*. The form is elliptical, frequently tapering at both ends and even prominently pointed at the apex. The length is about 2 inches, diameter 1½ inches, color bright orange yellow. Stem three-fourths to one inch in length, stout; skin about one-eighth inch or more in thickness, terebinthaceous and disagreeable in taste, rather brittle, easily separable from the snowy white pulp which surrounds the seeds. The flavor is acid unless the fruit is almost over-ripe, and strongly resembles that of *Lansium domesticum*. The character of the pulp is similar to that of the mangosteen, melting, juicy and beautiful in appearance. The seeds vary from 1 to 3, 2 being the commonest number, and are oblong-oval in form,

about 1 inch in length, adhering closely to the pulp. When cut a yellow gamboge oozes out of them. Boys are very fond of this fruit, but the Americans here do not care for it. It is said to make a very superior doce or preserve." (Dorsett, Popenoe and Shamel introduction.) For distribution later.

Cucurbita pepo. (Cucurbitaceae.) 37132-133. Seeds of squashes from Rome. Presented by Dr. Gustav Eisen. "Zucchetta nana 'Cerbero' and 'Romana.' Peculiar kinds of squashes. These squashes are eaten green, and while the flower is yet adherent to the fruit, and never when the fruit is ripe, at least I have never seen it eaten at that stage. Used stewed, fried, etc., in many different ways, like squash or green peas. It is most delicious when boiled in fresh butter and is fully equal to any other fresh vegetable in this country. Many eat the flowers when the fruit is between six to ten inches, always while green." (Eisen.) For distribution later.

Diospyrus kaki. (Ebenaceae.) 37168-213. Cuttings of 45 varieties of Japanese persimmon from Okitsu, Japan. Presented by Mr. T. Tanikawa, in charge of the Government Horticultural Experiment Station. "We take great pleasure in sending you scions of all the kakis which we now have in our garden. These kakis were gathered from several localities of this country as promising varieties. We must confess that it is very difficult to collect all the varieties named in our 'Special Bulletin No. 28' because many of them are seedlings of some varieties and named by the finder or the cultivator. Such kakis are almost always inferior in quality and too scarce in number to be recognized as a variety. For these reasons we regret that we cannot send such kakis to you." (Tanikawa.) For distribution later.

Dolichos lablab. (Fabaceae.) 37081. Seeds of the Bonavist bean from Tientsin, China. Presented by Dr. Yamei Kin, Pei-Yang Woman's Medical School and Hospital. "The common name is 'old woman's ear' and it is a specialty of the north. The ripe beans can be used like any other bean, but are generally used in the pod like string beans. As it grows readily and likes the cold weather, just so that it does not actually freeze the blossoms, it thus provides a green bean when the other string beans are gone. In cooking it the object is not to make it soft but just to plunge it into boiling hot water and not much more than scald it, so that it still remains crisp enough for a salad, then it is dressed with vinegar and oil. It should be grown on a trellis. The pods when full grown measure

from four to six inches long and about a couple of inches across, but people generally do not wait until they are full grown but begin to eat them when young so that the whole pod can be used." (Kin.) For distribution later.

Eugenia klotzschiana. (Myrtaceae.) 37392. Seeds of the pera do campo from Lavras, Minas Geraes, Brazil. "*Cabacinha do campo* or *pera do campo.* A pear shaped, very fragrant fruit produced by a small wiry shrub occasionally seen on the campo here. The plant grows to a height of 4 or 5 feet under favorable conditions, with very few branches; when growing on land that is pastured it grows only two feet high, with many unbranched stems arising from the ground. The leaves are oblong lanceolate, rather hard and tough, tomentose beneath, and alternative. The fruits are strikingly similar in appearance to a small russet pear. They vary from 2 to 3 inches in length, and are russet brown in color, with a thick tomentum on the surface, the skin is thin and surrounds a whitish, very juicy and aromatic pulp, so fragrant that its odor can be detected several yards away. The flavor is rather acid but very aromatic. The seeds vary from 1 to 3 or 4, and are oval or somewhat irregular in shape, about one-half inch in diameter. The proportion of seed to flesh is small for a wild fruit. The season is said to be November and December; there are very few fruits left now (January 23). A very superior *doce* is said to be made from this fruit, which seems on the whole unusually promising for trial in the mildest parts of the United States." The botanical determination of this fruit was not certain when the first page of this bulletin was printed. (Dorsett, Popenoe and Shamel introduction.) For distribution later.

Garcinia vidalii. (Clusiaceae.) 37381. Seeds of the libas from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture. "This characteristic species of Garcinia is a native of the Province of Rizal, Luzon. It is easily recognized by its rather large, numerously veined leaves which are broadly rounded at the apex and frequently retuse. It is a tree attaining a height of about 12 meters, the branches and branchlets being stout and somewhat angular, brownish or yellowish, rugose when dry. The leaves are opposite, and obovate or elliptical-obovate, 15 to 25 cm. long and 6 to 14 cm. wide. The flowers are 5-merous, the staminate ones with stout, 4-angled pedicels about 5 mm. long. The fruit is fleshy, greenish and smooth when fresh, subglobose, 5-6 cm. in diameter. Edible." (Merrill in Philippine Journal of Science, vol. 3, p. 361, 1909.) For distribution later.

Glycine hispida. (Fabaceae.) 37062-063, 37074-075, 37077, 37080, 37228-325, 37326-356, 37396-404. Seeds of soy beans from various parts of Manchuria and Korea. These introductions include the largest collection of Korean soy bean varieties ever brought to this country, 98 varieties with full descriptions and native names being sent in by the American consul at Seoul, Korea. Other collections are from Pyeng-yang, Korea, and from Harbin, Manchuria, and Tientsin, China. All introduced in the effort to bring together all valuable Manchurian and Korean varieties. For distribution later.

Holcus sorghum. (Poaceae.) 37114-116. Seeds of sorghums from Zaria, northern Nigeria. Presented by Mr. K. T. Rae, Department of Agriculture. Three of the most commonly grown varieties introduced for the work of the Office of Forage Crop Investigations in bringing together the best West African varieties. For distribution later.

Linum usitatissimum. (Linaceae.) 37085-089. Flax seeds from Adis Ababa, Abyssinia. Received through the British Legation, in the absence of an American consul. Five varieties of flax introduced because of the special promise of certain earlier introductions of Abyssinian flax. For distribution later.

Myrciaria edulis. (Myrtaceae.) 37094. Seeds of the cambucá from Rio de Janeiro. "A very interesting myrtaceous fruit, closely resembling in foliage and general character of fruit the jaboticaba. Leaves lanceolate-elliptical, acuminate, deep green above, lighter green beneath, 4 to 5 inches long. Fruits oblate in form, 2 inches in width and 1½ inches long, sessile, surface smooth, bright orange in color. Skin thin, outer flesh one-fourth inch thick, tough and acid, inner pulp or edible portion surrounding the seed about the same thickness, soft, translucent, juicy, of average subacid flavor, somewhat resembling that of *Passiflora edulis*. Seed oval, compressed laterally, one-eighth inch long. For trial in Florida and California. (Dorsett, Popenoe and Shamel introduction.) For distribution later.

Phaseolus radiatus. (Fabaceae.) 37078. Seeds of bean from Tientsin, China. Presented by Dr. Yamei Kin, Pei-Yang Woman's Medical School and Hospital. "Lü to. This makes a better quality of starch than anything else. It is curious that in China the starch obtained from maize or wheat is not valued as much as that made of this bean for laundry purposes. They also make a vermicelli from the starch of this bean, and one can at once distinguish

it from that made from ordinary starch by the fact that it keeps its clearness and shape much better no matter how much it is boiled. It also has a better flavor and good keeping qualities. Perhaps it might be an addition to the laundry starches of America as I fancy it would take a much better gloss as it is harder than ordinary starch and would not need so much paraffin added to make a gloss. I doubt if the American palate would care for the vermicelli, as it is clear like glass and the long strings are most terribly slippery to eat, worse than the round Italian spaghetti." (Kin.) For distribution later.

Vigna sinensis. (Fabaceae.) 37104-110. Seeds of cowpeas from Zaria, Northern Nigeria. Presented by Mr. K. T. Rae, Department of Agriculture. Seven varieties of cowpeas introduced for the work of the Office of Forage Crop Investigations in bringing together the principal varieties of cowpeas from all parts of Africa. For distribution later.

Zea mays. (Poaceae.) 37219. Seeds of corn from Puerto Bertoni, Paraguay. Presented by Dr. Moises S. Bertoni. "Seeds of a new variety of Early Hard Maize, *communis minor.* This is a new variety which we believe will be of great interest in those countries in which the early European maizes give good results with difficulty. It is a new variety which we have obtained in this Agronomic Station by hybridization and selection of various species of hard and soft maizes of different degrees of earliness. It is almost as early a ripener as the variety Early Soft Maize, which serves as the base, and almost as hard and good as the Hard Canary Maize with which it was first crossed. It is notably hardy and drought resistant. The plant is small and of good production." (Bertoni.) For distribution later.

NOTES FROM CORRESPONDENTS ABROAD.

Mr. Frank N. Meyer writes from Tai an fu, Shantung, China, March 29, 1914. "Yesterday I returned from a hurried trip to Feitcheng, bringing back with me eight grafted trees of the famous Fei peach and herewith I am sending you via the American Consul-General at Shanghai, one of these grafted trees and also a bundle of scions. Would you kindly have them given the best of care. I have also sent to Chico a similar shipment, through the American Consul-General at Shanghai, and still have on hand the other six trees which I will send from Tientsin by freight to Chico, together with another lot of bulky stuff. Then also I am sending you, through the same channel a package

of fresh ginger rhizomes for planting, No. 1214. The peach material is labeled 1213 and I am enclosing the Inventory notes, describing the shipment. We had much trouble in getting these peaches as the people asked the most fabulous prices, for instance 40 and 50 dollars a tree. My interpreter, through some diplomatic dealings, obtained a plot containing eight trees, for forty dollars. As a result we had to leave Feitcheng rather hurriedly because the relatives of the man who made the deal had not been consulted and they wanted to take the trees back or destroy them. Well two are now on the road to America and the others go with me tomorrow. We hope to take the 3 A. M. train for Tientsin so as to get the Hawtrees and other plants off for America."

Mr. Frank N. Meyer writes from Peking, China, April 7th, 1914. "As you will notice, I have landed again in old Peking and received a cordial welcome from my many friends here. Dr. Reinsch, our Minister, wanted to hear straight away what sort of a trip I had. Well, I cannot say that my trip has been a bad one, for so far as collecting of material is concerned, for I have obtained material of some very important things like all these varieties of Persimmons; these very large Jujubes; large-fruited Chinese haws, trees of the famous Fei peach; nuts and scions of an apparently disease-resistant form of the Chinese chestnut; remarkable varieties of tree-peonies; a new lumber tree (Catalpa bungei) besides several minor things.

The one hundred and twenty photographic exposures I made on this past trip were developed and this morning I obtained the films and prints. There are some striking ones among them, which will serve their purpose well of illustrating some coming new industries. The large fruit-jujubes have come out especially well.

Then I will have to announce to you the coming into my possession of 175 pieces of mail, among which a goodly number of letters from you, for which I tender my best thanks. Some weeks will pass before I am through with it all.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

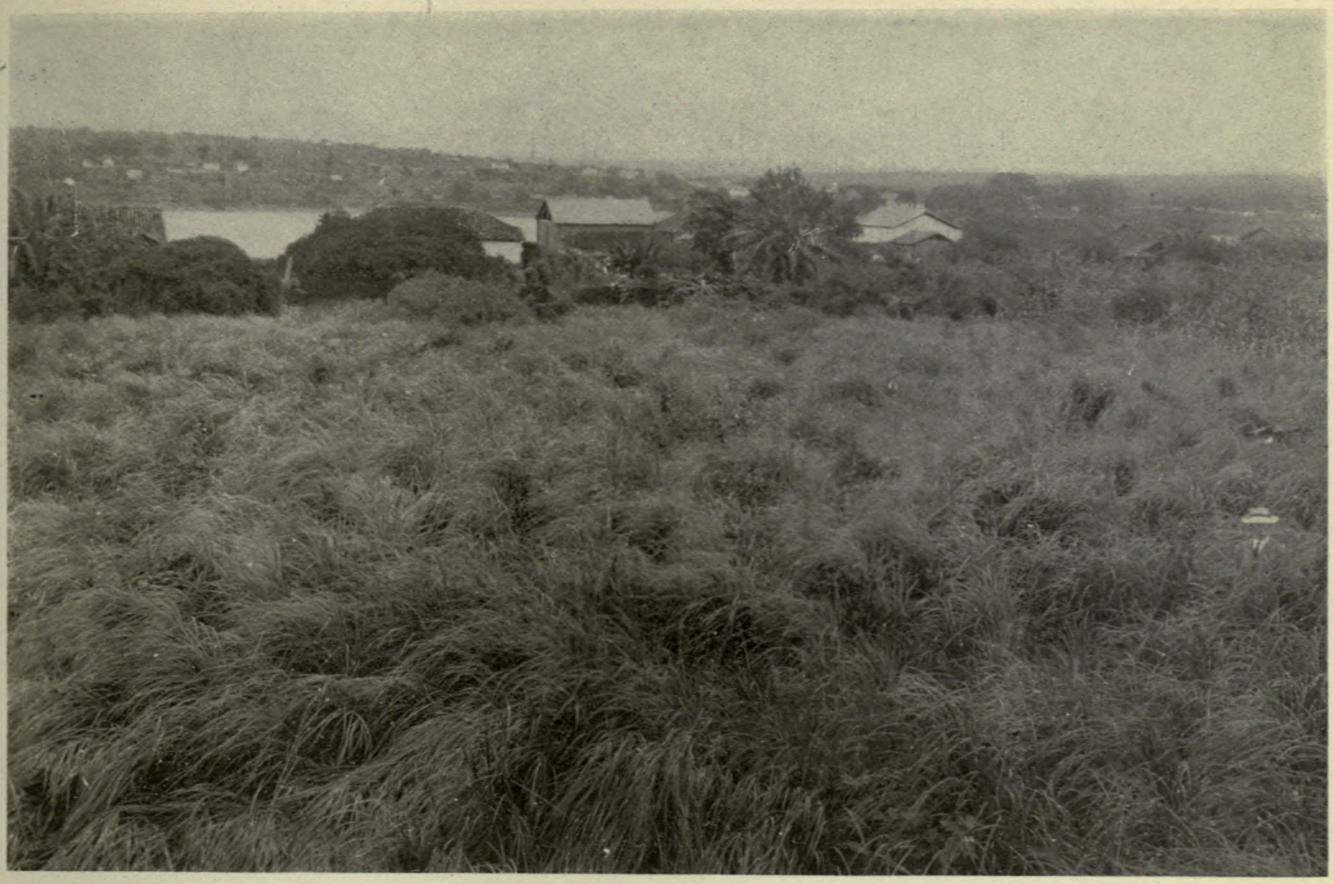
David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and F. W. Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Scientific Assistant, in charge of Seed Collection and Office Herbarium.
R. A. Young, Scientific Assistant, in charge of Dasheen Investigations.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes Foreign Correspondence, and Publications.
E. L. Crandall, Photographer.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow), Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Subtropical Plant Introduction Field Station.
W. H. F. Gomme, Assistant Farm Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.
S. A. Beach, Field Station Superintendent in charge of Ames, Iowa, Plant Introduction Field Station.
J. H. Allison, Expert.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. H. Harold Hume, Glen St. Mary, Fla.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Mr. William H. Raynes, Tallahassee, Fla.
Mr. J. F. Rock, Honolulu, Hawaii.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.



Andropogon rufus. Capim Jaragua.

A view across a small field of jaragua grass in the edge of the town of Pirapora. In this region, as well as other sections of southeastern Brazil, jaragua is one of the principal forage plants, although usually considered inferior in quality to capim gordura (Melinis minutiflorus). It is a perennial grass, growing to a height of six feet or more when not cut promptly, and said to be resistant to cold and prolonged rains. According to Pio Correa it contains 2.23% of digestible protein. Photograph by P. H. Dorsett, Pirapora, Minas Geraes, Brazil, February 10 1914. No. 1751.

Panicum spectabile(?) Capim de Angola.

A load of grass being carried into the town of Bom Fim from the adjacent valley where it is grown. In the state of Bahia Angola grass, or capim de Angola, as it is known in Portuguese, is one of the commonest and most highly esteemed forage crops. It is fed to both horses and cattle. While generally grown on low wet ground near the coast, in the interior it is often seen on comparitively dry land. Photograph by P. H. Dorsett, Bom Fim, state of Bahia, Brazil, February 25, 1914, No. 2079.

Chloris elegans. Capim catingueiro.

A rare grass cultivated in the Horto Florestal at Joazeiro, where it is considered by Dr. Leo Zehntner, the director, an especially promising species. It grows to a height of about three feet, producing seed heads of good size. The fact that it has proved adapted to semi-arid regions makes it of interest to farmers in the Southwestern United States. Its food value is believed by Dr. Zehntner to be high. From photograph by F. W. Popenoe, Joazeiro, state of Bahia, Brazil, February 24, 1914, No. 2061.

Panicum spectabile(?) Capim de Angola.

Planting capim de Angola on the municipal farm at Bahia, Brazil. This is an especially wet peice of ground; instead of planting in the ordinary manner the soil is stirred up with hoes and the grass, after being scattered over the surface, is tramped in with the feet. Ditches are required to drain off the surface water, which accumulates rapidly. Ten days from planting the field is in active growth. Photograph by P. H. Dorsett, Bahia, Brazil, March 10 1914. No. 2143.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction, of the Bureau of Plant Industry, of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 96. April 1914.

Genera Represented in This Number.

Attalea	37868	Genipa	37833
Campomanesia	37834	Melinis	37983
Citrus	37724	Myrciaria	37829
	37840	Pouteria	37929
	37843	Rosa	37978
Copernicia	37866	Spondias	37861-865
Eugenia	37830-831	Ziziphus	37923

Plates: Truck gardening near Rio de Janeiro.
Avenue of Mangos, Rio Botanical Gardens.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Matter in these multigraphed sheets must not be published without special permission.

Attalea funifera. (Phoenicaceae.) Seeds of the piassava palm from Bahia, Brazil. "A large, pinnate-leaved palm, found in certain sections of the state of Bahia. It is valuable because of the fiber which it furnishes, as well as for its hard, black fruits, which are used to make buttons. The oily kernel, elliptical and nearly two inches in length, is used as an article of food by the natives of the poorer classes. Piassava fiber is an important article of export at Bahia, and the manufacture of piassava brooms forms an industry of considerable extent. The fiber is extracted from the leaf stalks, and is coarse, stiff and cinnamon brown in color." (Dorsett, Popenoe, and Shamel introduction.)

Campomanesia fenzliana. (Myrtaceae.) 37834. Plants of a guabiroba from Rio de Janeiro, Brazil. Purchased of Eickhoff, Carneiro, Leao & Co. "A small Brazilian myrtaceous tree with foliage remarkably similar to that of some of the European oaks. The common name 'guabiroba', which is applied to it, is also given, with various minor variations such as 'gabiroba' and 'guabiraba', to several fruits of the two allied genera Abbevillea and Campomanesia. Although occasionally reaching a height of from 30 to 35 feet, the guabiroba as commonly seen in gardens is a tree of from 20 to 25 feet in height, rather sparsely foliated, with elliptical-ovate entire leaves about two inches in length, the veins depressed on the dorsal surface, prominent on the ventral surface. The fruits greatly resemble small guavas, being from three-fourths to one inch in diameter, oblate in form, the apex crowned by a large disk and prominent 5-parted calyx. In color they are orange yellow when fully ripe, the surface slightly wrinkled and covered with a thick tomentum or down. The skin is thin, and surrounds a layer of granular light yellow pulp which encloses the seeds and the soft pulp in which they are embedded. The flavor is similar to that of the guava, but frequently a little stronger. The principal use to which the fruits are put is the manufacture of jams and jellies. The tree seems likely to prove suitable for cultivation in south Florida and southern California." (Dorsett, Popenoe, and Shamel introduction.)

Citrus grandis. (Rutaceae.) 37724. Plant of a seedless pomelo from Siam. Presented by Mr. Harry Boyle, Assistant Horticulturist, Department of Agriculture, Philippine Islands. "On September 13 the writer proceeded to the Nakoi Chisii district where the finest pomelo orchards are located. The largest of these was owned by a Chinese planter and contained about 20 hectares, three-fourths of

which was planted with pomelos of the 'seed' variety while some 25 per cent of the area contained 'seedless' trees. The orchard is divided into plats some 7 meters wide by 60 to 90 meters long, separated by trenches some 3 to 4 meters wide by two and one-half meters deep. The pomelo trees are planted in single rows on these plats. All trees are propagated by marcottage, or the 'don' method. The soil of this orchard contains about 60 per cent clay. The first fruits examined in the 'seedless' section proved to be full of seeds. Upon inquiry as to the reason for this it was stated that the seedlessness was due to the salt deposited from the brackish water which backs up into the river during the dry season; the planter also said that a coconut shell of salt was placed in the hole at the time of transplanting the tree and that another shellful was given the tree each year." (Boyle, Philippine Agricultural Review, February 1914.)

Citrus sinensis. (Rutaceae.) 37840. Plants of Laranja selecta from Rio de Janeiro, Brazil. Purchased of Eickhoff, Carneiro Leao & Co. "This unusually choice orange is one of the two principal varieties grown in the Rio de Janeiro district, and has the added distinction of having been, as all the evidence indicates, the parent of the Bahia navel orange or 'selecta de umbigo,' as it is still called, the culture of which in California at the present day forms so important an industry. The origin of the 'selecta' orange is obscure. It has been cultivated in Brazil for more than a century, and although it has been superseded in Bahia by its offspring, the navel orange, it is still cultivated commercially near Rio de Janeiro, particularly in the Sao Goncalo district at Nictheroy. The main crop ripens in July, but it commences to come into the market in March and continues until October. On the fancy fruit stands it brings two or three milreis ($.65 to $1.00) per dozen, but in the public market it can be purchased at a considerably lower price. Around Nictheroy the fruit is picked and brought to the market in baskets strapped across the backs of mules and horses. While resembling the Bahia navel orange in general characteristics, 'selecta is normally oblate in form, contains numerous seeds, and does not produce a navel. The typical 'selecta' as found in the markets may be described as follows: General form roundish oblate; cross section regularly round; size medium large, good specimens being three to three and one-half inches in length and three and one-fourth to three and one-half inches in breadth; stem sometimes inserted somewhat obliquely; base usually tapering very little, flattened for a distance of one-half to three-fourths inch from the stem insertion, sometimes slightly

rough, due to thickening of the skin; cavity none or practically none; apex flattened and frequently depressed for a distance of one-half inch from the stigmatic point; surface varying from smooth to rather coarsely pitted; color varying from yellowish green to greenish yellow early in the season, becoming entirely yellow later on and bright orange yellow when fully ripe; skin one-eighth to one-fourth inch thick, usually thickest around the base of the fruit, the oil glands large and abundant; segments eleven to thirteen, rag extremely tender, but core very large, frequently one-fourth inch in diameter at center of fruit, usually solid; flesh light orange, tender, very juicy; flavor never mawkish nor insipid, always sprightly, subacid, with plenty of character, probably as good as the Bahia navel and with greater acidity; quality very good; seeds variable in number, ranging from 1 to 20, but commonly about twelve perfect ones and six abortive or undeveloped ones, in size rather large, varying from one-half to one-fourth inch in length. It is a common occurrence to find rudimentary navels in 'selecta' oranges from trees which ordinarily produce normal fruits. This phenomenon is so common that in some lots of fruit examined in the Rio de Janeiro markets as many as ten per cent showed rudimentary navels, of varying stages of development. In some instances the navels are as large as in the average navel orange. Natives of Rio de Janeiro generally consider the 'selecta', as grown in that locality, superior to the navel orange as grown at Bahia. The Bahianos, of course, do not admit this, but the fact remains that 'selecta' as grown in Rio de Janeiro is somewhat more highly flavored than the Bahia Navel. Both for this and for other reasons it seems important that 'selecta' be given a thorough trial in the orange growing sections of the United States." (Dorsett, Popenoe, and Shamel introduction.)

Citrus sinensis. (Rutaceae.) 37843. Plants of the 'laranja da pera' orange from Rio de Janeiro, Brazil. Purchased of Eickhoff, Carneiro Leao & Co. "This variety is distinguishable from 'selecta' by its elongated form, smaller size, thinner skin, and sweeter flavor. It is extensively cultivated in the vicinity of Rio de Janeiro, especially at Maxambomba and in the neighborhood of Cascadura. While it is not pyriform in shape as the name 'pear orange' would indicate, it is usually oval, and as seen in the markets is rarely more than three inches in diameter. Ripening at the opposite season of the year from 'selecta' the two do not usually compete in the markets. The typical fruit may be described as follows: Form broadly oval to nearly spherical; cross section

round; size medium small, length two and seven-eighth to three and one-half inches, diameter two and one-half to three and one-fourth inches; stem inserted squarely; base rounded, cavity none or practically none; apex rounded; surface smooth; color when fully ripe bright orange; skin one-eighth inch thick, pliable, oil glands rather small; segments commonly ten, rag rather tough, core open, one-fourth to three-eighths inch in diameter; flesh golden yellow, tender, exceedingly juicy; flavor sweet, apt to be cloying when the fruit is very ripe; quality good; seeds averaging eight to ten, small to medium size. While most abundant in the markets about Christmas time the season commences in late September or October and extends to the end of January. The variety is an extremely prolofic bearer, quite a contrast in this respect to 'selecta', whose bearing habits are those of the Bahia navel orange. The branches of 'pera' trees are not infrequently so heavily laden with fruits that they have to be propped to prevent them from breaking. One of the finest groves of this variety seen in the vicinity of Rio de Janeiro is that of Sr. Cezar Augusto Henriques, at Maxambomba. The trees here are all budded on the sour orange ('laranja de terra'), the commonest stock in this region and generally considered the best; at four years of age the budded trees produce on an average five hundred fruits per tree, according to the statement of the owner. The usual price obtained for the fruits is 5$000 (about $1.60) per hundred. The orchard is situated on a hillside, the soil being rich clay loam, grayish in color. No deep cultivation is given the trees, but the surface is frequently hoed to keep down weeds." (Dorsett, Popenoe, and Shamel introduction.)

Copernicia cerifera. (Phoenicaceae.) 37866. Seeds of the carnauba palm from Joazeiro, Bahia, Brazil. "A valuable wax palm found along the banks of the Rio Sao Francisco from well above Barra to below Joazeiro. In places it grows in great abundance, forming large groves along the banks of the stream. The leaves are fan-shaped, rather finely cut, two to three feet in diameter, and light green in color. The plant frequently attains a height of from twenty-five to thirty feet. The wax is extracted by cutting the leaves and drying them in the sun, when the wax exudes in the form of a powder. Candles made from it are yellowish brown in color, extremely hard and burn with a clear yellow fairly brilliant light. They sell for forty reis each, but very few are made nowadays and they are difficult to obtain. The fruit is for hog feed and many of the large land owners are preserving the trees for the production of fruit. The trunks are extensively employed in building houses. The wax industry was former-

ly prosperous in this region, but it is not now very remunerative and only small quantities are exported. The leaves are used for brooms, etc." (Dorsett, Popenoe, and Shamel introduction.)

Eugenia arrabidae. (Myrtaceae.) 37830. Plants of the cambuhy da India from Rio de Janeiro. Purchased of Eickhoff, Carneiro Leao & Co. "A small, highly ornamental tree, native of Brazil. It is commonly known as Cambuhy da India or Uvaria do campo. The leaves are small, linear-lanceolate, opposite, deep green in color. The flowers, which are produced in September, are axillary and terminal, and are followed by small, yellow, rather acid fruits which are appreciated by the natives. The bark is said to be astringent and aromatic." (Dorsett, Popenoe, and Shamel introduction.)

Eugenia myrcianthes. (Myrtaceae.) 37831. Plants of the Cereja do Rio Grande, from Rio de Janeiro. Purchased of Eickhoff, Carneiro Leao & Co. "The cereja do Rio Grande, a small tree native of Brazil, with small, oblong, acute, dark green leaves, producing in June oblong, purplish red fruits about the size of an olive, with greenish flesh. It is said to bear prodigiously; the fruits are rather hard when ripe, and for this reason are usually mashed into a paste before being eaten." (Dorsett, Popenoe, and Shamel introduction.)

Genipa americana. (Rubiaceae.) 37833. Plants of the genipap from Rio de Janeiro. Purchased of Eickhoff, Carneiro Leao & Co. "A large tree, native of the American tropics. In the British West Indies it is called genipap, in Brazil 'genipapo'. At Bahia it is very common, and during the season the markets are full of the fruit. Some of the finest specimen trees we saw were fully sixty feet in height, symmetrical and stately in appearance, but devoid of foliage for a part of the year as the species is deciduous in this climate. The leaves are a foot or more in length, oblong-obovate, sometimes entire, sometimes more or less dentate, dark green in color. The flowers, which are produced in November, are small, light yellow in color. The fruits are the size of an orange, broadly oval to nearly spherical in form, russet brown in color. After being picked they are not ready to be eaten until they have softened and are bordering on decay. A thin layer of granular flesh lies immediately under the tender membranous skin, and enclosed by this is a mass of soft, brownish pulp in which the numerous small, compressed seeds are embedded. It is difficult to eat the pulp without swallowing the seeds. The flavor is characteristic and quite

pronounced; it may be likened, perhaps to that of dried apples, but it is somewhat stronger and the aroma is considerably more penetrating. As well as being eaten in the fresh state, the fruit is put to numerous other uses, one of the most important of which is the manufacture of a distilled liquor known as 'licor de genipapo.' This article retains the peculiar and distinctive flavor of the ripe fruit, and is highly esteemed by the Brazilians. Its manufacture is carried on commercially in certain regions. A refreshing drink known as 'genipapada', is also prepared from the ripe fruit, with the addition of sugar and water, much as lemonade is made in the United States. A dye is extracted from the green fruit, which, according to Barbosa Rodrigues, is employed by the Mundurucu Indians for tattooing. It is also used for coloring clothes, straw, hammocks, etc. Various medicinal uses are attributed to the genipap by the Brazilians; the root is said to be purgative, and the juice of the fruit diuretic." (Dorsett, Popenoe, and Shamel introduction.)

Melinis minutiflora. (Poaceae.) 37983. Seeds of capim gordura from Sao Joao d'el Rey, Minas, Brazil. Nos. 37983 to 38041 represent seeds of grasses collected by the Brazilian Exploring Expedition at Joazeiro, Sao Joao d'el Rey, Januaria, Xique Xique, and other points in Bahia and Minas. Among these are various varieties of guinea grass, capim d'Angola, and other forage and pasture grasses, some of them flourishing on pure sand, others of very rapid growth. (Dorsett, Popenoe, and Shamel introduction.)

Myrciaria edulis. (Myrtaceae.) 37829. Plants of the Cambucá from Rio de Janeiro. Purchased of Eickhoff, Carneiro Leao & Co. "The cambucá, a native of the state of Rio de Janeiro, and commonly cultivated in gardens for its highly appreciated fruit. In growth the tree is very similar to the jaboticaba, the leaves being considerably larger, however, and the bark a darker shade of brown. The fruits are produced both on the small limbs and on the trunk, though the specimens we have seen do not fruit clear down to the ground as the jaboticaba frequently does. The season is from February to May in this region. In form the fruit is oblate, one and one-half inches in length and two inches in breadth, stem practically none, the fruits being sessile or nearly so; base flattened, calyx persistent, a very small, brown disk not over one-eighth inch in diameter, level with the surface of the fruit; skin smooth, orange yellow in color, thin, tenacious, fairly tough; flesh divided into two portions, the firm outer flesh one-fourth inch thick, leathery, very acid in taste, light orange in color, the inner flesh con-

stituting the edible portion of the fruit, being soft, jelly-like in consistency, translucent, light orange in color, subacid in flavor, greatly resembling some of the Passifloras, quite pleasant and evidently highly esteemed by the Brazilians; seed oval or nearly so, compressed, about seven-eighths inch in length, three-fourths inch in breadth and seven-eighths inch in thickness, the cotyledons light purple in color; seed coat deep brown, reticulated, not adhering very closely to the flesh." (Dorsett, Popenoe, and Shamel introduction.)

Pouteria caimito. (Sapotaceae.) 37929. Seeds of abiu from Bahia, Brazil. "The abiu, a rather rare but highly esteemed fruit, both here and at Rio de Janeiro. In form it is elliptical, two to three inches long, deep yellow in color. The one to four large, oblong seeds are surrounded by a translucent, whitish pulp very similar in flavor to the sapote and fully as agreeable." (Dorsett, Popenoe, and Shamel introduction.)

Rosa setipoda. (Rosaceae.) 37978. Plants of a rose from London, England. Purchased of James Veitch & Sons, Ltd. "A remarkable rose, allied to *R. macrophylla*, with large corymbs of handsome rose-pink flowers. Its long pedicels clothed with spreading gland-tipped bristles and numerous foliaceous bracts give it a singular appearance. The species is not uncommon in shrubberies in the mountains of the north-western part of the province of Hupeh, China." (E. H. Wilson, Kew Bull. 1906:158.)

Spondias tuberosa. (Anacardiaceae.) 37861-865. Seeds of the imbú from Bahia and Minas Geraes, Brazil. "The imbú or umbú, one of the most popular fruits of this region. The tree, which is wild here and quite common in some places, is of a peculiar habit of growth, branching four to six feet above the ground and forming a very broad, dense, and flat topped head of foliage. When the large limbs are cut and placed in the ground as fence posts they take root and grow. The fruits, which are sometimes produced in great profusion and are ripe at this season (February), are oval in form, about one and one-half inches in length and light green in color. The skin is rather tough, and encloses the translucent, juicy pulp in which is embedded the single large seed. The flavor of the pulp is rather suggestive of a sweet orange, and is agreeable in the extreme. Aside from being consumed in the fresh state the fruit is extensively used for the manufacture of jellies and jams in which a considerable trade has been built up. In addition a popular dessert called 'imbuzada' is made from the slightly unripe fruit by mixing the

strained and sweetened pulp with milk. The ease of its culture together with the superiority of its fruit recommends the imbu for careful trial in Florida and California." (Dorsett, Popenoe, and Shamel introduction.)

Ziziphus joazeiro. (Rhamnaceae.) 37923. Seeds of the jua from Joazeiro, Bahia, Brazil. "Seed of the jua, collected from wild trees on the catinga near the river two miles below town. This interesting and valuable tree is common on the catingas or dry lands bordering on the Rio Sao Francisco from Joazeiro nearly up to the border of the state of Minas. Here at Joazeiro it is quite common, but the trees are usually found scattered among the other plants on the catinga and do not occur in large groves. In places where cattle and horses can get at the trees while young they are kept eaten off almost to the ground, and have a peculiar dwarfed, stunted appearance. When allowed to develop to mature size the tree forms a beautiful dense green umbrageous head of foliage thirty feet in diameter. The leaves are somewhat hard and brittle in texture, oval to ovate and about two inches in length. The small wood is armed with short stiff thorns which are not however, particularly dangerous. The fruit varies greatly in size according to the tree by which it is produced. The best fruits are nearly an inch in diameter, creamy yellow in color, spherical or nearly so. Inside the thin skin is a thick layer of mealy flesh, within which lies the seed and the layer of translucent, mucilaginous pulp which surrounds it. The seed is about the size and shape of a small olive stone. The pulp adheres to it very closely and can scarcely be separated even in the mouth. The flavor is peculiar and somewhat insipid. The trees bear prodigiously, the ground under them being covered with fruit at the end of the season. Sheep, cattle, horses, and swine eat the fruit greedily, and it is considered wholesome for them. The principal value of this tree would seem to be as a source of stock food in dry regions, both the fruits and the foliage being of value for this purpose. In addition the ornamental value of this tree, and its drought-resisting qualities, commend it for culture in arid regions. While it is probably not very hardy, it seems likely to be adapted to the Southwest." (Dorsett, Popenoe, and Shamel introduction.)

NOTES FROM CORRESPONDENTS ABROAD.

Dr. Joseph Bailie writes from Nanking, province of Kiang-su, China, May 22, 1914: "You see from a bulletin which will be sent you that the Chinese officials have taken hold of the Colonization work which I began and are

now making the Experimental Station a center and a model from which to develop afforestation in this province. The Nanking people have suffered much in the late revolutions but especially in the second, when Chong Hsun, a devil incarnate, let his armies loose and destroyed what they could not loot. Though ordered to leave this city by the President, he would not budge till the city gave him $800,000 in cash. This was the last straw. Now notwithstanding all this the city has contributed $20,000 to push this work that I am in. It will be hard for some of the subscribers to raise the money still they are keeping the work going ahead. Under these circumstances it would be of great encouragement to them if a substantial donation of trees could be obtained in recognition of their public spirit, by the U. S. Department of Agriculture. They appreciate any recognition of their efforts and are really trying to do their best. The difficulties can only be appreciated by one who actually lives here. You were generous enough to send me through the U. S. Consul here a large quantity of yellow and white pine seed year before last and last year. The seeds have done good work, though we lost more than three-fourths of the young seedlings through drought and by our men having been driven off by bullets, still we have over 20 acres of nice young seedlings transplanted from those seed. Could a special effort be made this year to help us? They want to do big things this next year. The governor is one of the committee and most enthusiastic. You can see his picture in the bulletin."

Avenue of Mangoes in the Botanic Garden of Rio de Janeiro.

These trees, apparently all seedlings, were brought from India during the reign of the Emporer Don Joao VI, probably about 1808. As far as known none of them has ever matured any fruits, although they bloom profusely at times and even set fruits which grow to the size of a walnut before they fall. Dr. Willis, director of the garden, attributes this to the low, wet soil in which they are growing. The trunks have been hacked to encourage fruiting, a custom widely practiced among the natives of this region. Hacking is always done on the day of Sao Joao Baptista, the 24th of June. Dorsett, Popenoe, and Shamel Photograph No. 506. Rio de Janeiro, Brazil.

Truck gardening in the neighborhood of Rio de Janeiro.

In such gardens as these the vegetables which supply the markets of the city are produced. Lettuce, radishes, onions, and other vegetables are grown in the small beds seen in the picture, each bed being raised about 18 inches above the level of the walks, and bordered with a row of kale around the outside. Water is distributed to small reservoirs throughout the garden by bamboo flumes; from these reservoirs it is distributed over the beds by means of large watering pots. Reed mats are placed over the beds to shade the plants when first set out. Dorsett, Popenoe, and Shamel Photograph No. 1268. Taken between the city of Rio and the Internacional Hotel.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
E. L. Crandall, Photographer.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow), Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
W. H. F. Gomme, Assistant Farm Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.
S. A. Beach, Field Station Superintendent in charge of Ames, Iowa, Plant Introduction Field Station.
J. H. Allison, Expert.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. H. Harold Hume, Glen St. Mary, Fla.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Mr. William H. Raynes, Tallahassee, Fla.
Mr. J. F. Rock, Honolulu, Hawaii.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction, of the Bureau of Plant Industry, of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 97. May 1914.

Genera Represented in This Number.

Amygdalus	38178	Paeonia	38339-340
Catalpa	38254	Paulownia	38184
Citrus	38101	Punica	38185
	38293	Pyrus	38240-242
	38335		38262-271
Crataegus	38176		38277-278
	38283-284	Rollinia	38171
Euonymus	38237	Rosa	38161-166
Hypericum	38153	Saccharum	38257
Inocarpus	38135		38332
Malus	38231	Salix	38233
	38279	Zinziber	38180
Mimusops	38172	Ziziphus	38244-247
Olea	38336		38249-253
Oryza	38327		38258-261
Osterdamia	38177		

Plates: Large-sized Chinese jujubes.
Chinese Haw orchard and fruits.
Fei peach orchard.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Matter in these multigraphed sheets must

Amygdalus persica. (Amygdalaceae.) 38178. Cuttings and plants of the Fei peach from Feitcheng, Shantung, China. "A remarkable variety of clingstone peach, considered to be the best in all China. Size large to very large; shape round, very heavy, often over one pound apiece; skin quite downy and of pale yellowish color with a slight blush on one side. Flesh very juicy and sweet and of excellent aromatic flavor, of white color, except near the stone where it is reddish. Stone very large and pointed, flesh strongly adhering to it. Ripens in early to middle October and possesses excellent shipping and keeping qualities. The trees are of erect growth when young, but when older they spread out considerably, remaining of open growth. To reach their greatest perfection these peaches need to be fertilized each spring, while during dry seaaons, they are irrigated from wells. The fruit is also thinned. The soil they seem to thrive in best is a porous, light clayey loam of reddish color, retaining moisture quite well, but not becoming too soggy. The local people calculate that on an average a tree supplies ten dollars Mexican worth of fruit each season and they consider an orchard of these peaches a very valuable asset indeed. The climate around Feitcheng is of a semi-arid nature and this variety of peach may be expected to thrive especially well in the regions west of the Rocky Mountains. Chinese name, 'Fei tao,' meaning 'Fei peach.' (Meyer's introduction.)

Amygdalus persica. (Amygdalaceae.) 38272-276. Peach cuttings from near Tai an fu, Shantung, China. Five varieties, one said to be very large and juicy, weighing up to a pound, and keeping to December, another of medium size, ripening late, and keeping well, a third very ornamental flowering variety, with small, peculiarly-shaped 3-pointed, rosy-red fruits, and two of the 'pien tao' or flat varieties, of good quality. (Meyer's introduction.)

Catalpa bungei. (Bignoniaceae.) 38254. Trees of catalpa from near the village of Wang yu ko, Shansi, China. "A quickly growing Chinese timber tree, growing to large size, specimens seen 100 feet tall, with trunks 10-15 feet in diameter a few feet above the ground. The Chinese plant this tree for its wood, which is strong, light, durable and non-warping. It resembles walnut to a considerable extent and is much in demand for table tops and for fine furniture. This tree might possibly be profitably cultivated in the semi-arid sections of the United States where the winters are not too severe, while the summers may be quite hot. They are easily propagated from

roots that are close to the surface of the ground and the tree thrives best when planted close to irrigation canals and on sheltered places. Chinese name 'Tchiu shu', meaning 'autumn tree.' (Meyer's introduction.)

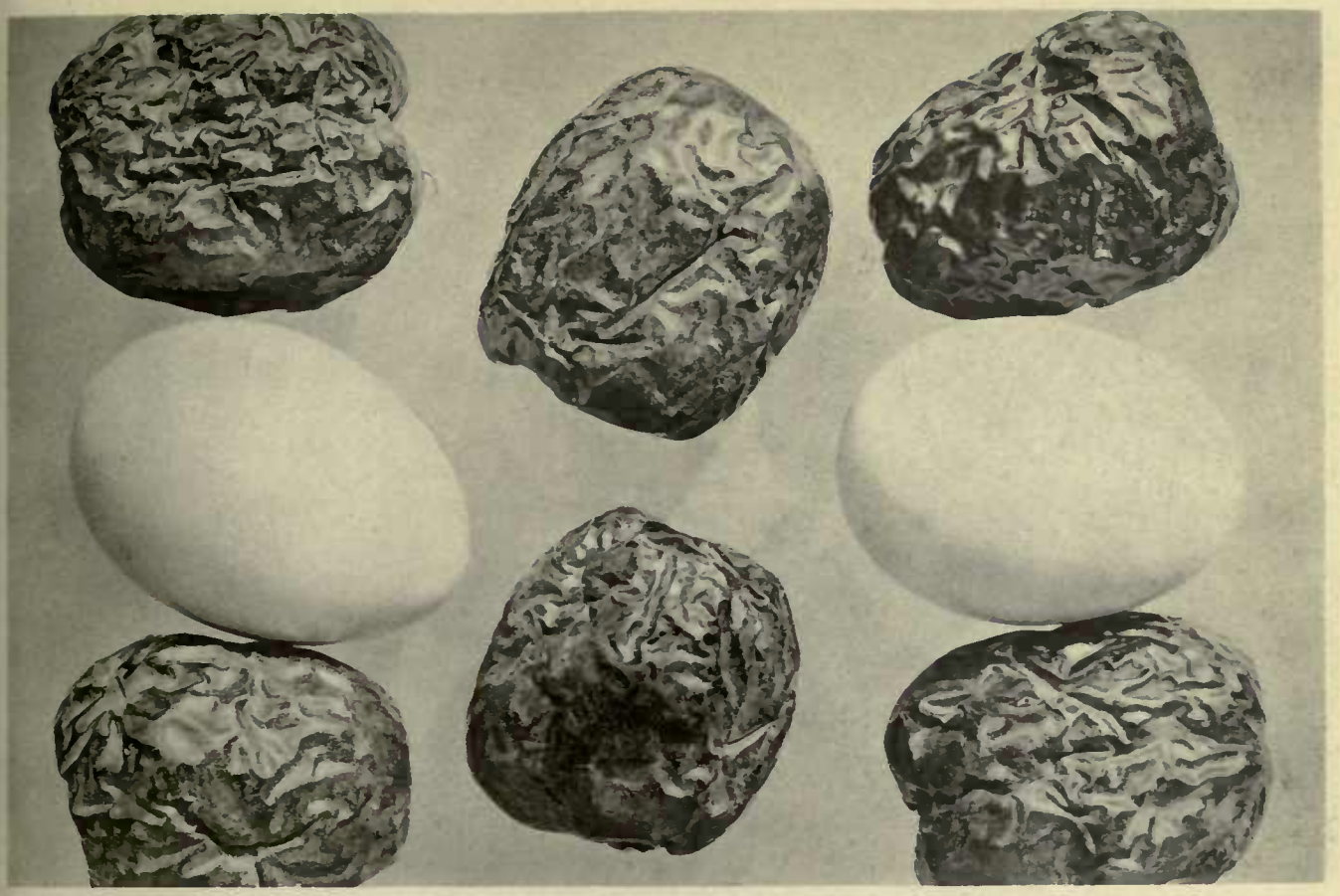
Citrus nobilis deliciosa. (Rutaceae.) 38101. Seeds of a mandarin orange from Lamao, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist in charge of Lamao Experiment Station. "Seeds of a small, oblate, very thin skinned mandarin of most excellent quality, that is imported from China in considerable quantities. It is to my mind greatly superior to all the mandarins I have eaten here or in Florida with the possible exception of the 'Oneco', which it very much resembles in flavor. Considering how well the mandarin reproduces itself from seed, at least a few seedlings of excellent quality should be obtained from these seed." (Wester.)

Citrus hystrix. (Rutaceae.) 38293. Seeds of the cabuyao from Lamao, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist in charge, Lamao Experiment Station. "A thorny tree from 6 to 12 meters in height with a rather dense rounded head, frequently with drooping branches; young growth more or less purplish, smooth. Leaves 16-24 cm. (6-10 in.) long, broadly winged, the area of the wings frequently exceeding the leaf area; fruit variable, from oblate to pyriform turbinate or oblong, smooth, to more or less corrugate, greenish lemon yellow; rind medium thick, flesh greenish, juicy, sharply acid, aromatic, contained in 12 to 15 locules; juice-sacs short and blunt; seeds many, flat, reticulate. Range from Malaysia including the Philippines to India. Like all other Philippine citrus fruits, the cabuyao goes under a multiplicity of names, varying with the tribal languages of the archipelago and the different forms of the fruit; some of these names are Suha, Balincolong, Biasong, Tibulit, Colobot, etc. Excepting the citron the cabuyao is perhaps less esteemed than any of the better-known citrus fruits in the Philippines and can scarcely be said to be cultivated. Some kinds are eaten with fish by the Filipinos and make a fairly good 'ade'. Most forms are also used in cleaning clothes and as a hair wash. The cabuyao has scarcely been introduced beyond its native habitat and is seldom seen even in botanical collections. For attractive shapeliness certain forms of the cabuyao are surpassed by no other citrus fruit. Some of these forms unquestionably will be recognized as subspecies or possibly as separate species on closer study." (Wester, Bulletin No. 27, Citriculture in the Philippines.

Citrus sp. (Rutaceae.) 38335. Seeds of the 'natsu mikan' from southern Kyushu, Japan. Presented by Mr. E. H. Wilson, collaborator of this Office. "During my recent trip to southern Kyushu I made a collection of the various citrus fruits cultivated there. Among these fruits is an orange which I am unfamiliar with. Its Japanese name is 'natsu mikan' and it is said to keep longer than any other variety and to be very sweet at midsummer. It is a light-skinned variety with rather pale flesh and the skin separates from the flesh as it does in the pomelo. The tree bears while still small and the fruit is decidedly handsome in appearance. In February and March it is still on the tree and the flavor is sour and very decidedly bitter. I shall test the fruit again at midsummer to find if it becomes distinctly sweet. Very likely this orange is well known to you but it occurs to me that sweet oranges at midsummer would find a ready market. If of any interest to you there would be no difficulty in securing a supply of seeds. I think growing plants could also be obtained. Apparently it is as hardy as the Navel orange." (Wilson.)

Crataegus pinnatifida. (Malaceae.) 38176, 38283-284. Cuttings and scions of a large-fruited haw from the village of Ta ching ko, near Tai an fu, Shantung, China. "The Chinese haw fruit seems to thrive best on well-drained semi-gravelly or sandy loam and the best quality of fruit is produced on trees that grow on mountain terraces. It is not unlikely to become a fruit of considerable importance in America, when once it has become known. The Chinese graft and bud this haw on wild and seedling stock of the same species, but experiments should be made to determine whether other species of Crataegus will also be suitable for stocks." (Meyer's introduction.) Three varieties, one of which, of agreeable sour taste, can be kept almost a year, and is excellent for jellies, compotes, cake fillings, etc.

Euonymus bungei. (Celestraceae.) 38237. Cuttings from the village of Tchang pai, Shensi, China. "A spindlewood, usually seen as a shrub, but when not molested, growing to a medium sized tree. The plant is an excellent bank binder, throwing up suckers all around; it stands drought to a wonderful degree, while it resists alkali also to a certain degree. On most places this shrub is cut down every year, but this treatment seems to make it spread more. It deserves to be given a thorough test as a bank and soil binding plant, especially in the semi-arid parts of the United States." (Meyer's introduction.)



Ziziphus jujuba. Dried Chinese Jujubes.

The large round jujube or *Ta-yuan-tsao* from Pai hsiang chen, Shansi Province, China. (Hens' Eggs for comparison). The Tsao or Chinese jujube has proven hardy in the latitude of Washington and has borne good fruit in Texas and California. The discovery by Frank N. Meyer and the successful importation of cuttings of this unusually large fruited variety, S.P.I. No. 38243, cannot fail to have an effect upon the spread of jujube culture in this country. Photograph by Meyer, Feb. 14, 1914.

Amygdalus persica. The Fei Peach.

An orchard of the Fei peach at Feitcheng, Shantung Province, China. A thousand taels ($700) worth of fruit was sold from this small orchard in the fall of 1913. It is one of the highest priced peaches in China retailing for 4-8¢ apiece. A seedling of this Fei peach was fruited last season at the Chico Field Station, but Mr. Meyer has now succeeded in importing fine cuttings and plants of this very large late clingstone variety which the Chinese rate so highly. Photograph by Frank N. Meyer, March 20, 1914.

Hypericum oblongifolium. (Hypericaceae.) 38153. Seeds of a St. John's wort from Ventimiglia, Italy. Presented by Dr. Alwin Berger, Curator, La Mortola Gardens. "A shrub, truly hardy in England, with evergreen foliage and large handsome yellow blossoms, which is a native of northern India, Nepal, and the Himalayas. It is found growing at elevations of from six to twelve thousand feet. It is a small rather compact shrub, with red-brown terete branches. The leaves of this species which are the largest of the genus, are dark green above, pale and glaucous beneath, and two to four inches in length, and evergreen." (Botanical magazine, pl. 4949.)

Inocarpus edulis. (Fabaceae.) 38135. Seeds of the Tahiti-chestnut from Pago Pago, American Samoa. Presented by Commander C. D. Stearns, Governor. "One of the most striking features of the forest. It bears a kidney-shaped fruit which is eaten cooked, when not quite ripe, and tastes much like a chestnut. The wood is of light color, straight, of fine texture, and very tough. It is used for burning lime in open kilns, the wood having the remarkable quality of burning readily when green. In some of the Pacific Islands the nuts are preserved in pits, like breadfruit, where they ferment. In Samoa it forms a staple food for several months of the year. The wood is perishable and of little economic value. The bark is astringent." (Stearns.)

Malus sp. (Malaceae.) 38231. Scions of a crab-apple from Sianfu, Shensi, China. "A flowering crab-apple, of low branching, wide spreading growth, said to bear masses of small, double flowers of rosy-red color. Obtained from the garden of the English Baptist Mission Hospital at Sianfu." (Meyer's introduction.)

Malus sp. (Malaceae.) 38279. Scions of an apple from the village of Fan dja tchwang, near Tai an fu, Shantung, China. "A variety of apple, said to be large, of red color; flesh firm and of sweet flavor. Chinese name 'Ta ping kuo', meaning 'large apple'. Apparently very drought-resistant, and possibly of value for the drier parts of the United States." (Meyer's introduction.)

Mimusops sp. (Sapotaceae.) 38172. Seeds from the Rio de Janeiro Botanic Garden. "A small, sapotaceous fruit from the Jardin Botanico. Tree about 20 feet high. Fruit oval, slightly under one inch in length, maroon in color. The flesh surrounding the single seed is whitish and of very pleasant flavor resembling that of the sapodilla. (Dorsett, Popenoe and Shamel introduction.)

Olea europea. (Oleaceae.) 38336. Cuttings of olive from Bermuda. Collected by Mr. Peter Bisset, of this Office. "Cuttings from an olive that fruits sparingly in Bermuda. For trial in Florida, where soil and climatic conditions are similar and where the olive does not fruit." (Bisset.)

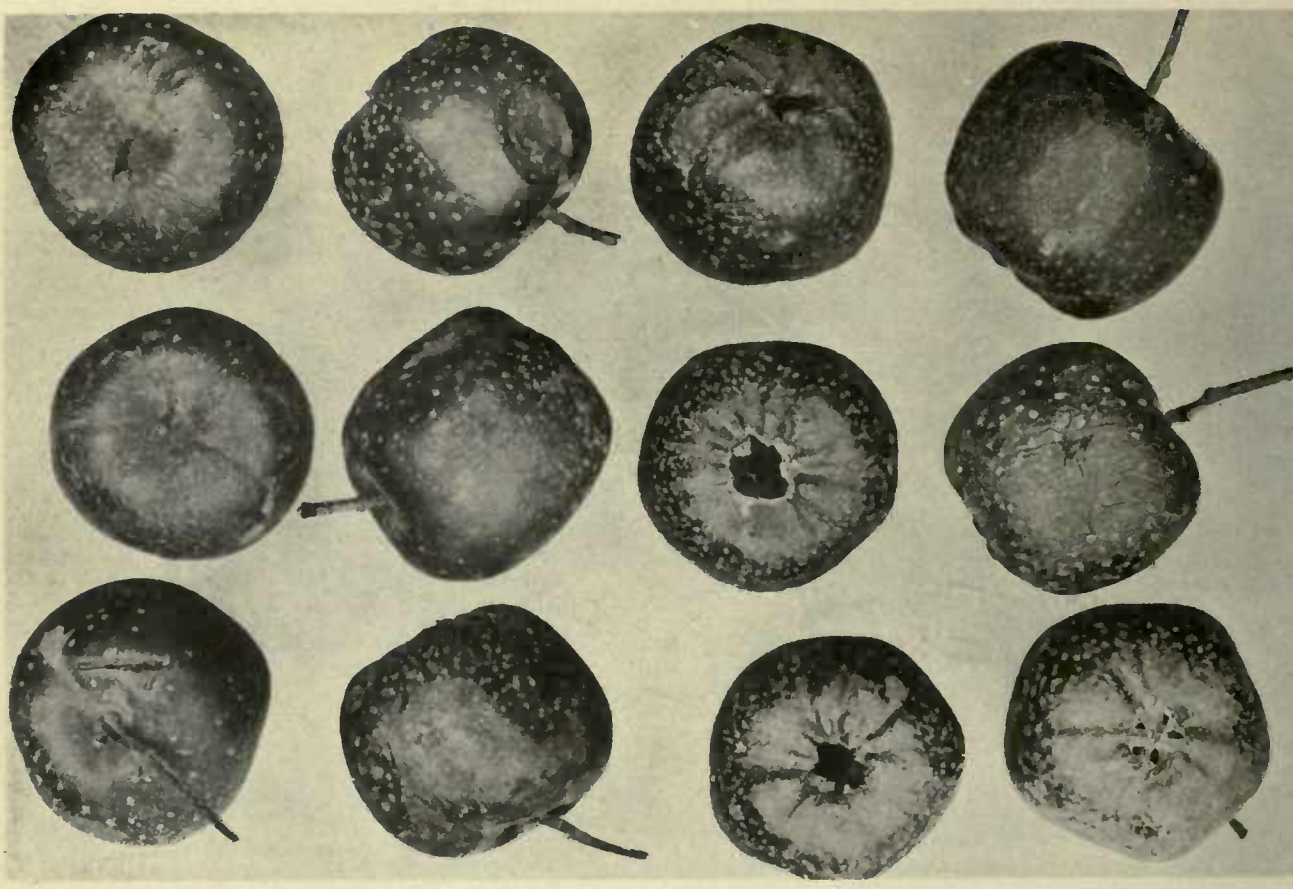
Oryza sativa. (Poaceae.) 38327. Seed of a rice from Dakhla Oasis, Western Egypt. Purchased from Sheikh Abu Bakr, through contract made by Prof. S. C. Mason, of this Bureau, on his visit to the Oasis in October 1913. "This rice is a variety grown in the Oases of Kharga and Dakhla, and regarded by the natives as quite distinct from the so-called valley rice which is used in reclaiming the salty lands in the delta of lower Egypt. Mr. Wright, manager of the Corporation of Western Egypt at Kharga, and Sheikh Abu Bakr, the chief man of Dakhla Oasis, both especially recommended this rice as being a valuable crop for reclaiming salty lands. They stated that it can be grown successfully on land quite too strong for barley. My idea in bringing this in was not that it would be of sufficient importance to use as a main crop on high priced irrigated lands, but that it should be given a test as a useful crop in reclaiming lands at present too salty for the growing of alfalfa and barley. There are considerable areas of land of this character in the Coachella valley accessible to a good flow of artesian water. In Dakhla the land is bordered up with quite high ridges, and the water kept almost continuously on the rice, it being essential, of course, that there be some wash or lower tract into which the surplus water can be thrown. My idea is that it is this excess of water that really does the chief work of improving the alkaline ground rather than the rice crop itself, but if a crop of rice can be raised toward the expense of reclaiming such land and bringing it into condition for usefulness with other crops, the rice certainly justifies itself." (Mason.)

Osterdamia sp. (Poaceae.) 38177. Cuttings of a grass from the mountains near Tai an fu, Shantung, China. "A grass of low growth and of spreading habit, thriving to perfection on thin decomposed rock soil, along mountain paths where much tramping over takes place; also found on inclines where the mat of roots prevents the soil from being washed out. Of decided value apparently as a bank, lawn and golf-course grass, especially for the drier parts of the United States." (Meyer's introduction.)

Paeonia albiflora. (Ranunculaceae.) 38339. Plants of herbaceous peonies from Tsaochou fu, Shantung, China. Among these are said to be yellow, green and black peonies. (Meyer's introduction.)

Crataegus pinnatifida. Chinese Haw Orchard.

An orchard of Chinese Haw trees near Tai an fu, Shantung province, China. Trees of the Chinese haw which were grown from seeds sent in in 1906 by Mr. Frank N. Meyer are now growing in various localities in this country. As yet none of the imported varieties have fruited. The fact that good sized haw orchards are planted in China should encourage American horticulturists to study our own haw species and find out if they or the Chinese species are not worthy of orchard cultivation in this country. Photograph by F. N. Meyer, March 21, 1914.



Crataegus pinnatifida. Chinese Haw Fruits.

A superior variety of the large Chinese haw, from the markets of Tai-an-fu. They are there known as the large sour haw (*Ta suan tsa*). From these fruits (shown natural size) is made a marmalade which is eaten extensively in North China. Samples of this marmalade imported by Mr. Meyer indicate that it is of very good quality. Photograph by F. N. Meyer, March 20, 1914, Tai-an-fu, Shantung, China.

Paeonia moutan. (Ranunculaceae.) 38340. Plants of tree peonies from Tsaochou fu, Shantung, China. "Twelve rare varieties of tree peonies, among which are said to be yellow, blue, green, and black flowered ones. The soil best suited to these tree peonies is a loose porous, sandy loam, with perfect drainage and of great depth. In the district to the northwest of Tsao-chou one finds such soil and climatic conditions as seem to suit this peony to perfection and the plants are grown there on fields as regular crops and are sent all over eastern China, going as far south as Canton, and as far north as Mukden to be used mainly for forcing purposes. There are said to be more than 300 varieties in cultivation here. The best time for transplanting is considered to be September, while propagation is effected through division. The plants require three and one-half feet distance in all directions to develop to perfection, while older plants need even 4-6 feet distance apart. At the approach of winter these peonies are covered over with some soil, which is taken away again in early March. This saves the flower buds from being winter-killed and reduces danger of damage by men or beasts, as the wood of the tree peony is quite brittle. It is thought that possibly an industry could be established in some suitable section of the semi-arid southwestern United States, where the tree peony could be grown in large quantities, to supply florists with one of the most decorative flowers for winter forcing purposes." (Meyer's introduction.)

Paulownia fortunei? (Scrophulariaceae.) 38184. Root cuttings from the village of Chin kao tchien, Honan, China. "A paulownia, planted here and there on sandy lands as a soil binder and a windbreak. The wood is of a very light nature and is used in the construction of light furniture, playthings for children, bowls, jars, etc. Of value as a soil binder and an ornamental park tree, especially for the mild wintered sections of the United States." (Meyer's introduction.)

Punica granatum. (Punicaceae.) 38185. Cuttings of a pomegranate from Tsaochou fu, Shantung, China. "A pomegranate, producing very large double flowers of a brilliant red color. No fruits are set. Chinese name, 'Hswang sheh liu hua,' meaning 'Double flowered pomegranate.' Obtained from the garden of the Roman Catholic Mission." (Meyer's introduction.)

Pyrus sinensis. (Malaceae.) 38240-242, 38262-271, 38277-278. Cuttings of pears from Shansi, Honan, and Shantung, China. Fifteen varieties, some of which are remarkable for their keeping qualities, and others of very large size, all of probable value for breeding work. (Meyer's introduction.)

Rollinia orthopetala. (Annónaceae.) 38171. Seeds of the 'fruta de condessa' from Rio de Janeiro, Brazil. "The 'fruta de condessa' (Countess's fruit) indigenous in the state of Rio de Janeiro, from whence the fruit is shipped to the markets of the capital and sold there at 100 to 400 reis (4-14 cents) apiece. In general form the fruit is conical to cordate, frequently 3 to 4 inches in diameter. The surface is covered with conical protuberances of varying prominence, and is creamy yellow in color when the fruit is fully ripe. The skin is rather tough and not easily broken; it surrounds the milky white, somewhat mucilaginous flesh, in which the seeds are embedded. The flavor is somewhat insipid, but is evidently esteemed by the Brazilians as evidenced by the quantity of the fruit sold. The seeds are not as numerous as in many other annonaceous fruits, but are about the same size as those of the cherimoya. The fruit ripens in February and March in this region. Should be given a trial in Florida and southern California particularly as a stock for the cherimoya and other choice annonaceous fruits." (Dorsett, Popenoe, and Shamel introduction.)

Rosa spp. (Rosaceae.) 38161-166. Seeds of roses from Ventimiglia, Italy. Presented by Dr. Alwin Berger, Curator, La Mortola Gardens. Six varieties of roses, as yet unidentified, from E. H. Wilson's collections in western China. Of probably value for rose breeders and for comparative tests.

Saccharum narenga? (Poaceae.) 38257, 38332. Cuttings of sugar cane from Honan, China. Two numbers, one a very hardy variety of low sugar content, the other a mixture of varieties, of higher sugar content. Recommended for trial for molasses production, and also for fodder for milch cattle. (Meyer's introduction.)

Salix sp. (Salicaceae.) 38233. Cuttings of a willow from the village of Tong dja pu, Shensi, China. "A willow, growing to be a tall tree, with a heavy trunk. The main branches are of erect growth and of dark green color, but the young twigs are slender and gracefully drooping and of a delicate yellowish color. A fine tree for parks, especially when planted in a clump or as solitary specimens, where they can be seen from some distance." (Meyer's introduction.)

Zinziber officinale. (Zinziberaceae.) 38180. Rhizomes of ginger from Feitcheng, Shantung, China. "A variety of ginger grown on sandy loam in the vicinity of Min yang to the south of Tai an fu. Much hawked about throughout Shan-

tung and retailing at from 10 to 12 cents Mexican per pound. It is much relished as a condiment in soups and with meat dishes and is considered to be very healthful, so much so in fact that Confucius advised his pupils to make ginger one of their relishes to be eaten daily. The Chinese plant the rhizomes as soon as the soil becomes warm and harvest the plants in the autumn after a light frost; the rhizomes are stored in cool dugouts and kept covered over with slightly moist sandy soil. Chinese name 'Hsien chiang', meaning 'Fresh ginger.'" (Meyer's introduction.)

Ziziphus jujuba. (Rhamnaceae.) 38244-247, 38249-253, 38258-261. Scions of jujubes from Shansi and Honan, China. Thirteen varieties, all from regions heretofore unexplored horticulturally, and one with fruits said to be larger than ordinary hen's eggs. Some varieties preferably eaten fresh, others when put up in weak brandy. (Meyer's introduction.)

NOTES FROM CORRESPONDENTS ABROAD.

Mr. O F. Cook writes from Coban, Guatemala, May 20, 1914: "At last we have reached a place accessible to a post-office, and can begin sending a few things. As I feared the Florida trip has made us too late for several things that could have been had in abundance in March and April. The cotton has been harvested for the most part, and we were not able to carry out the plan of making individual plant selections, and were obliged to content ourselves with seed in bulk. The hard shelled anona at Cahebin has a definite season in April, and no fruits or living seeds were to be had, but an American coffee planter has located here and I left some mailing tubes with him for next year, and with proper reminding in February or March these seeds could probably be had without serious difficulty as the trees are not rare about Cahebin. The tree is quite large and of upright habit, quite different from the other anonas. The leaves are thick, dark green and shining, like those of a magnolia. It is also said to be a free bearer, and the shell is very hard. Another find not properly appreciated before is the green sapote, injerto, or roxtul as the Indians call it. This was described recently by Pittier as *Calocarpum viride* but the generic name is a homonym and I have proposed *Achradelpha* to replace it. This new species is a much finer tree than the true sapote and apparently much better adapted to a cool climate. The foliage is much heavier than that of the sapote and of a deeper green color, in form and general appearance not very unlike that of the loquat. But the trees grow to a large size and are very handsome. They take the place of the sapote altogether at the higher altitudes around Coban, though both trees are found in the Senabu and Cajabin districts. The

failure of the sapote to thrive in Florida need not exclude the green sapote, and a trial planting will be in order. We shall send some seeds by mail and keep others with us. They are like those of the true sapote, but smaller and in some varieties much shorter, for the fruits of the green sapote run through the same series of varietal forms as those of the sapodilla. The quality of the flesh is distinctly superior to that of the true sapote, and much more likely to please the American palate. Anybody who likes papayas or Japanese persimmons might be expected to think favorably of the green sapote, for it comes distinctly into the same class of sweetish smooth-textured pulpy fruits. There is no astringency or unpleasant aftertaste whatever, so that one of the curing difficulties of the persimmon would be encountered. On the outside the fruits are a pleasing yellowish green color, more or less russeted at either end. The flesh inside is yellow, but with a reddish or brownish tinge, not as yellow as some of the Japanese persimmons, nor as dark as others.

"At present we are busy with the pacaya palms which are grown here in great abundance, so that any amount of seed could be obtained. Some of the palms have four, five, or even six pacayas, as the edible male inflorescences are called, so that we did not over-estimate the amount of the fruit that might be produced in a successful planting. I feel confident that the palms would grow very well under hot house conditions such as Goar and Reasoner have, and would suggest that a planting be made on that basis at Miami, with the idea of leaving some of the palms to grow to maturity. They attain a height of 12 to 15 feet but fruit much younger, probably in the third or fourth year.

"I might add that the roxtul or whatever it is to be called should have a chance in California as well as in Florida. Its climatic requirements should be much the same as those of the avocado. It is a much less tropical species than that of the true sapote."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant in charge of Explorers' Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow), Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
W. H. F. Gomme, Assistant Farm Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. H. Harold Hume, Glen St. Mary, Fla.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Mr. William H. Raynes, Tallahassee, Fla.
Mr. J. F. Rock, Honolulu, Hawaii.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 98. June 1914.

Genera Represented in This Number.

Acacia	38524	Mangifera	38379-382
Achradelpha	38478		38387
Amygdalus	38469-470		38390-391
Belou	38389	Nunnezharia	38403-404
Bombycodendron	38486		38582
Canarium	38372	Passiflora	38373
Cocops	38588	Persea	38400-402
Cocos	38428-434		38477
Coix	38473-476		38549-564
Dillenia	38383-384		38578, 38581
Dimocarpus	38374		38583, 38587
Diospyros	38482		38638-640
Eriobotrya	38496-497	Reinhardtia	38538-540
	38568	Rhododendron	38413
Ferula	38633	Soja	38450-462
Lactuca	38657	Zea	38544

PLATES: Macauba palms. Minas Geraes, Brazil.
The abiu, a Brazilian sapotaceous fruit.
Bamboo windbreak at Lavras, Brazil.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Matter in these multigraphed sheets must not be published without special permission.

Acacia verek. (Mimosaceae.) 38524. Seed of the gum arabic acacia from Khartoum, Sudan. Presented by Mr. S. A. Wood, Assistant Director of Forests, Department of Agriculture and Forests. "This tree produces the true gum arabic of commerce. It thrives best in a dry climate with a maximum rainfall of 21 inches and a dry period of no rain for several months. Any soil will suit it. The tree as it grows out here is fit for tapping in the fifth year after sowing." (Wood.)

Acradelpha sp. (Sapotaceae.) 38478-481, 38566. Seeds of the injerto from Coban and Guatemala City, Guatemala. Collected by Mr. O. F. Cook, of this Bureau. "Another 'find' not properly appreciated before is the green sapote, injerto or raxtul as the Indians call it. This was described recently by Pittier as *Calocarpum viride* but the generic name is a homonym and I have proposed Achradelpha to replace it. This new species is a much finer tree than the true sapote and apparently much better adapted to a cool climate. The foliage is much heavier than that of the sapote and of a deeper green color, in form and general appearance not very unlike that of the loquat, but the trees grow to a large size and are very handsome. They take the place of the sapote altogether at the higher altitudes around Coban, although both trees are found in the Senshu and Cajabon districts. The failure of the sapote to thrive in Florida need not exclude the green sapote, and a trial planting will be in order. The seeds are like those of the true sapote, but smaller and in some varieties much shorter. The fruits of this green sapote run through the same series of varietal forms as those of the sapodilla. The quality of the flesh is distinctly superior to that of the true sapote, and much more likely to please the American palate. Anybody who likes papaya or Japanese persimmons might be expected to think favorably of the green sapote, for it comes distinctly into the same class of sweetish, smooth, tender, pulpy fruits. There is no astringency or unpleasant aftertaste whatever, so that none of the curing difficulties of the persimmons would be encountered. On the outside the fruits are a pleasing yellowish-green color. more or less russeted at either end. The flesh inside is yellow, but with a reddish or brownish tinge, not as yellow as some of the Japanese persimmons, nor as dark as others." (Cook.)

Amygdalus persica. (Amygdalaceae.) 38469-470. Seeds of peaches from Feitcheng, Shantung, China. The famous Fei peach and a large variety of flat peach said to be of light-red color, and very juicy and sweet. Chinese name 'Ta hong pien tao,' meaning 'large red flat peach.' (Meyer's introduction.)

Belou marmelos. (Rutaceae.) 38389. Plants of the bael fruit from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. "Seedlings of a fruit obtained from a tree grown on the plaza of the largest pagoda in Siam which is situated in the town of Propatone. As this fruit was of a different type from the ordinary bael fruit it is thought that it might be of some value. The fruit is fully five inches in length and two and a half inches in width, more melon shape than pyriform." (Boyle.)

Bombycodendron vidalianum. (Malvaceae.) 38486. Seeds of the lanutan from Lamao, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist in charge, Lamao Experiment Station. "Seeds of the lanutan, a tree valuable for its wood, and also quite ornamental with large white flowers with a red center, shaped like those of the tropical *Hibiscus rosa-sinensis*, and about 7 inches in diameter. It is probably too tender for Florida." (Wester.)

Canarium sp. (Burseraceae.) 38372. Plants of the pili nut from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. "Trees of this nut are found growing in the various islands of southern Luzon, in the province of Albay. The leaves are compound, and the fruit is a triangular drupe containing one seed. The nuts are eaten quite extensively in the islands and throughout the Far East. From them an oil is extracted which is used for the table and also for burning in lamps. This nut, to my notion, is the best I have ever eaten. During the past two years quite a number of shipments of this nut have been made to San Francisco and they find a ready market. A gum, that resembles in properties the copaiba balsam, is extracted from the bark." (Boyle.)

Cocos rivalis. (Phoenicaceae.) 38588. Plants of a palm from Mayaguez, Porto Rico. Presented by Mr. W. E. Hess, Agricultural Experiment Station. "The rarest and prettiest of Porto Rico palms. This species greatly resembles in habit and appearance *Geonoma gracilus* but has more leaflets. At its type location it is growing on the bank of a stream with its roots in the water and in another location some 8 miles distant in an apparently dry limestone ravine. There are probably not more than a couple of dozen specimens left and among these less than half a dozen fruiting trees; being of little value to the natives, when large enough they are cut down for fence posts." (Hess.)

Cocos nucifera. (Pheonicaceae.) 38428-434. Seeds of seven varieties of coconuts from Pago Pago, American Samoa. Presented by Commander C. D. Stearns, Governor. Among

these varieties are some especially good for copra, others suitable for confectionery, and another usually picked green as the husk is considered of more value for manufacturing twine than is the fruit for copra making.

Coix lacryma-jobi. (Poaceae.) 38473-476. Seed of four varieties of Job's-tears from the Northern Shan States, Burma. Presented by Mr. H. G. Carter, Economic Botanist to the Botanical Survey of India, Indian Museum, Calcutta. This species is extensively cultivated by the native tribes of eastern India, Burma, Assam, southern China, and Malaya, and supplies a food product much appreciated especially in famine years, being parched, boiled or ground into flour. The seeds are used as beads in the industries of the natives but the hardness and high polish of shell are lost in cultivation so that only wild forms may be used.

Dillenia spp. (Dilleniaceae.) 38383-384. Plants from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. Two species of ornamental shade trees, the fruits of which are eaten with fish by the natives.

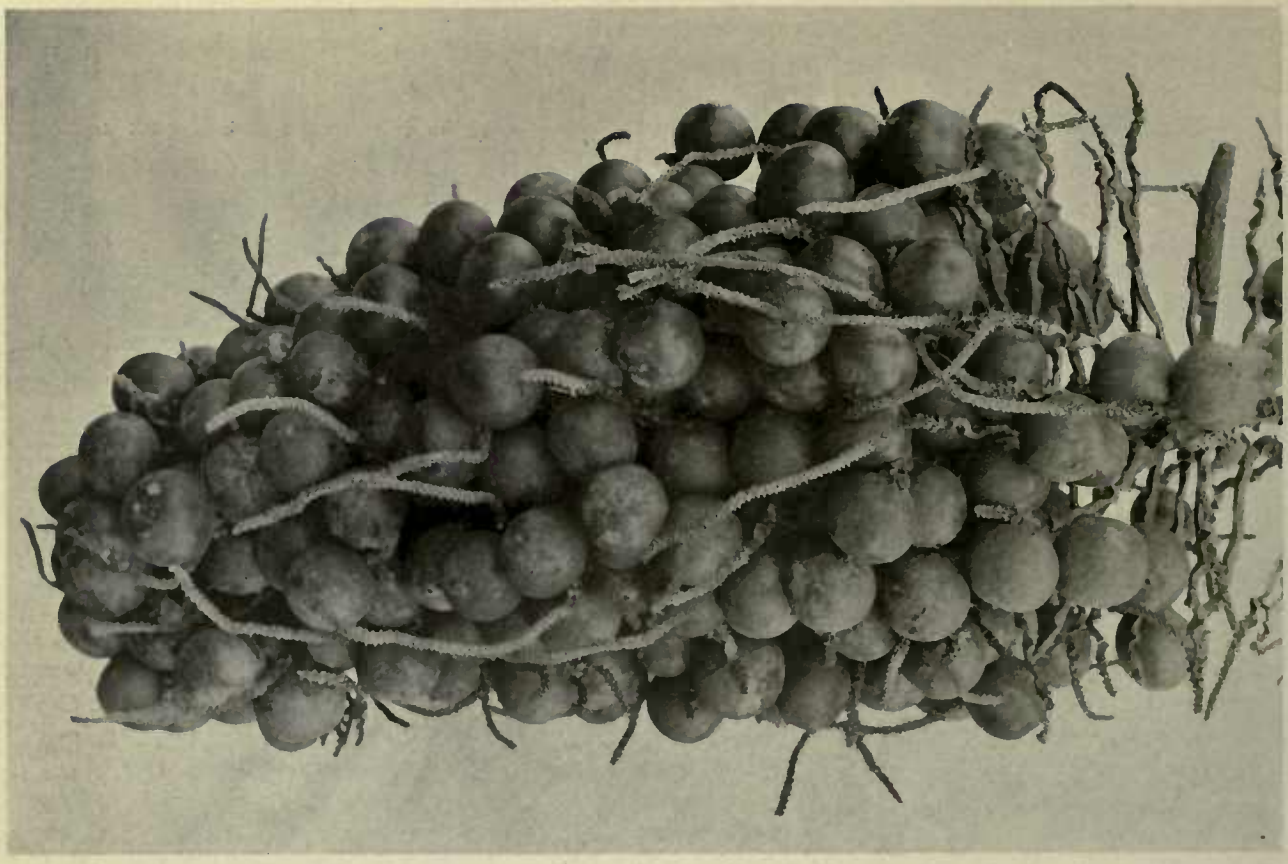
Dimocarpus sp. (Sapindaceae.) 38374. Plants from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. "Undoubtedly a new species, closely allied to the longan, found in the mountains of Cavite province near the town of Silang, P. I. The trees are one and one-half feet in diameter, and from 50 to 60 feet in height. The fruit has a remarkably sweet flavor, and the pulp is semi-transparent. It is greatly prized by all who eat it." (Boyle.)

Diospyros kaki. (Ebenaceae.) 38482. Cuttings of a persimmon from Sunnylands, Bermuda. Presented by Mr. Theodore Outerbridge, through Mr. Peter Bisset of this Office. "A variety bearing annually about 50 staminate flowers to one pistillate. It should therefore prove a valuable pollinator for planting in orchards of kaki persimmons, if the plants maintain this feature, as up to the present a great loss of fruit is sustained yearly in these orchards from lack of pollination. The fruit borne by the parent tree is said to be of good size and quality." (Bisset.)

Eriobotrya japonica. (Malaceae.) 38496-497. Seeds of loquats from Naples and Boscotrecase, Italy, and from Algiers, Algeria. Presented by Dr. Gustav Eisen, and Dr. L. Trabut, respectively. The three varieties are described: "38496. Seeds of a large plum-shaped loquat from Naples. Very early, ripe April 1. Extraordinarily sweet;

A GROUP OF MACAUBA PALMS NEAR SAO JOAO D'EL REY.
(*Acrocomia intumescens?*)

This beautiful palm is one of the features of the landscape in the interior of Minas Geraes. Its trunk is armed with long black spines. The leaves are of a glaucous green color, graceful and attractive in appearance, and seem to resist a great deal of thrashing about by the wind. In this photograph a small group is seen growing on a hillside overlooking the city of Sao Joao d'El Rey, at an altitude of more than 800 meters. The species is found at considerably greater altitudes than this, which leads to the belief that it may be hardy enough to succeed in California and Florida. Photo No. 1538 by Brazilian Expedition, taken at Sao Joao d'El Rey, Minas Geraes, Brazil, Jan. 27, 1914.



FRUITS OF THE MACAUBA PALM.

In the vicinity of towns many of the palms are cut to obtain the tender, white terminal bud, which is boiled and eaten as a vegetable. The fruit clusters are very large, sometimes weighing 60 or 70 pounds. Surrounding the hard seed in the center of each fruit is a thick layer of white, woody flesh which is very nutritious. Because of its insipid flavor it is not commonly eaten by the natives, but is used to fatten hogs with, for which purpose it is considered excellent. It also contains an oil, which is sometimes expressed in small quantities and used for lubricating. Photo No. 1294, by Brazilian Expedition, taken at Lavras, Minas Geraes, Jan. 22, 1914.

seeds variable and not in conformity with the fruit. This is the earliest in the market and quite remarkable as to size and quality." (Eisen.) "38497. Giant loquat. Very finest quality and largest size. Of bright deep orange color, seeds round. The tree is said to be an enormous bearer and of the very best quality. Ripe from May 1 to 24." (Eisen.) "38568. Tanaka loquat. An excellent variety with very firm flesh of a yellow color. Stands transportation for a period of one week. In Algeria the seeds give varieties superior to the original type, furnishing interesting varieties for the market." (Trabut.)

Ferula sp. (Apiaceae.) 38633. Roots of asafoetida from Meshed, Persia. Presented by Mr. Craig W. Wadsworth, American Consul-General, Teheran, Persia. "Ferula, which produces the asafoetida of commerce, grows in the vicinity of Meshed and Kerman. I was unable to obtain seed from the former place, but one of the missionaries at Meshed, with the assistance of the British Consul, succeeded in obtaining these roots." (Wadsworth.)

Lactuca sativa. (Cichoriaceae.) 38657. Lettuce seeds from Manila. Presented by Mr. O. W. Barrett, Chief, Division of Horticulture, through Mr. Harry H. Boyle, Assistant Horticulturist. "I have grown many varieties of lettuce and worked with a number of hybrids produced in the Department. If my memory serves me well there is not one variety or one hybrid which will equal this lettuce when grown properly. It strongly resembles a cross between Grand Rapids and Golden Queen, a semi-open and semi-heading variety. During its young stages of growth it has the brightest golden color of any lettuce I know of. This character alone would make it especially valuable for garnishing dishes. Aside from this it is a very good table lettuce. This was obtained from Macao, a Portuguese possession on the coast of China, sent to the Manila Bureau of Agriculture by Mr. Soares, Hongkong, China." (Boyle.)

Mangifera spp. (Anacardiaceae.) 38379-382, 38387, 38390-391. Mango plants from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. Seven varieties of mangos, including several unidentified varieties of good fruiting quality from the Buitenzorg Gardens, Cochin China, which is one of the best varieties of that country, and the carabao and pico, the best and second best Philippine varieties.

Nunnezharia pacaya. (Pheonicaceae.) 38403-404, 38582. Seeds and plants of the salad palm from Coban, and San Antonio, Guatemala. Collected by Mr. O. F. Cook of this

Bureau. "Pacaya palms are grown here in great abundance so that any amount of seed could be obtained. Some of the palms have four five or even six pacayas, as the edible male inflorescences are called. I feel confident that the palms would grow very well under slat house conditions, and would suggest that a planting be made on that basis at Miami, with the idea of leaving some of the palms to grow to maturity. They attain a height of 12 to 15 feet, but fruit much younger, possibly in the third or fourth year." (Cook.)

Passiflora laurifolia. (Passifloraceae.) 38373. Plants of passion fruit from Manila. Presented by Mr. H. T. Edwards, Director of Agriculture, through Mr. Harry H. Boyle, Assistant Horticulturist. "An edible variety obtained from Mr. P. Morange, Director, Saigon Botanic Gardens, Cochin China. The fruit is a bright yellow color, pear-shaped, about the size of the ordinary pear tomato, and very similar to it in appearance. There is extracted from the leaves a bitter substance which is employed to counteract intermittent fever." (Boyle.)

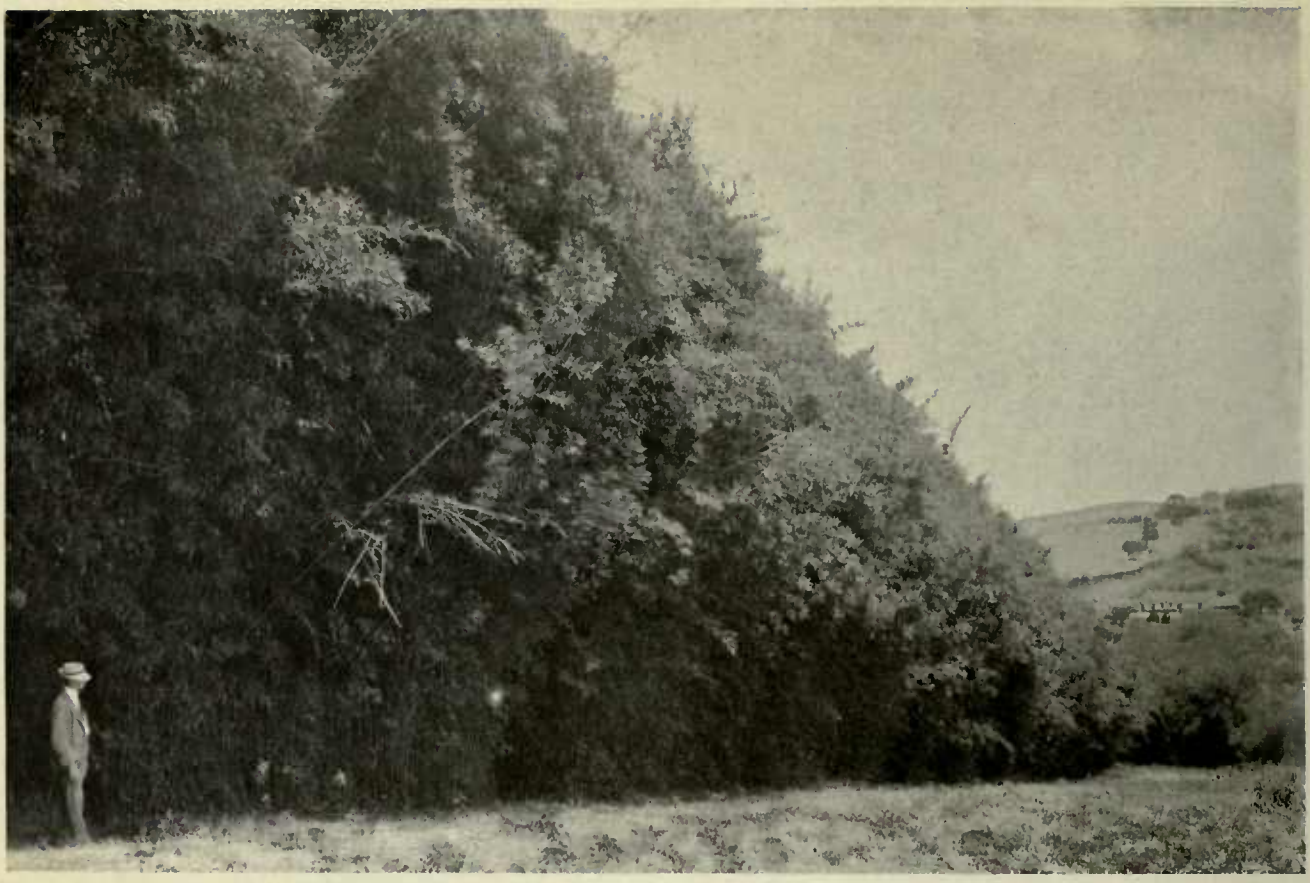
Persea americana. (Lauraceae.) 38400-402, 38477, 38549-564, 38578, 38581, 38583, 38587, 38638-640. Scions and seeds of avocados from Coban, Antigua, and Guatemala City, Guatemala. Collected by Mr. O. F. Cook, of this Bureau. "The avocado season is much too far along now (in May and June) to do satisfactory work. In most places the season is completely over but at the higher altitudes a few fruits are still in the market, as yet none of a quality to particularly recommend them. It is the late varieties of these countries that we want. The early varieties ripen in August and September, the others in December, etc., and as the colder places are reached the crop goes around into the spring months." (Cook.) Twenty-seven varieties of hard-shelled avocados.

Reinhardtia spp. (Phoenicaceae.) 38538-540. Seeds of a palm from Livingston, Guatemala. Collected by Mr. O. F. Cook. "A small palm 10-15 feet high; trunk 4 inches thick, bearing large clusters of coral red fruits about the size of thorn apples (Crataegus) and having exactly the same taste." (Cook.)

Rhododendron dauricum. (Ericaceae.) 38413. Seeds of a rhododendron from Novospasskoe, Russia. Presented by Mr. A. Woeikoff, Director, Bureau of Acclimatization. "This purple-flowered Rhododendron is a native of Dahuria, Manchuria, and Sachalin, and coming from a cold region, a spell of mild weather in midwinter causes it to begin to open its flowers very early in this country (England);

THE ABIU, A POPULAR BRAZILIAN FRUIT.

This valuable fruit is produced by the abieiro, or abiu-tree (pronounced ah-bee-u), botanically *Pouteria caimito* (R. & P.) Radlk., commonly cultivated in gardens about Rio de Janeiro and to a less extent at Bahia. The tree is upright, pyramidal in form, of small size and handsome appearance. The fruit ripens in February and March; externally it is deep yellow in color, occasionally overspread with green around the base. The flesh is white, translucent, melting in texture and of a sweet, bland flavor strongly resembling that of the sapodilla. The abiu is eaten while fresh, without cooking or preparation in any way. It is highly esteemed by all classes of Brazilians, and specimens such as the ones shown above sell in the markets of Bahia for the equivalent of three cents each. It should be given a trial in southern California and Florida. Photo No. 2105, by Brazilian Expedition, taken at Bahia, Brazil, March 3, 1914.



A BAMBOO WINDBREAK AT LAVRAS, BRAZIL.

This magnificent planting of bamboo surrounds the experimental farm of the Instituto Evangelico at Lavras, in the state of Minas Geraes. The species is believed to be an introduced one, as are several other bamboos which are widely grown and utilized in Brazil. As well as protecting the enclosed plantation from the wind, it serves as a source of material for the manufacture of baskets, chicken coops, fences, and particularly cheese crates, of which quantities are used in the dairying regions of Minas Geraes. Photo No. 1493, by Brazilian Expedition, taken at Lavras, Minas Geraes, Brazil, Jan. 22, 1914.

therefore they often fall a prey to frost before they can expand. Nevertheless it is a good kind of plant, for in those seasons when it does escape injury it adds a brilliant touch of color to the garden at a very dull season. There are several forms of the plant, some having deciduous leaves, and in other cases the leaves are evergreen or sub-evergreen." (The Garden, Jan. 11, 1913.)

Soja max. (Fabaceae.) 38450-462. Seeds of the soybean from Sianfu, Shensi, China. Thirteen varieties of this important Chinese crop plant, hitherto called *Glycine hispida* in the Office publications. Mr. C. V. Piper has recently shown that the name should be *Soja max* and we have listed the introductions here to direct attention to the change. (Meyer's introductions.)

Zea mays. (Poaceae.) 38544. Ears of corn from the Upper Gy Parana River, Brazil. Collected by Mr. Leo E. Miller, of New York, collector for the Roosevelt Brazilian Expedition. "Corn received from the 'Pauetes' or 'Powetes' Indians on the Upper Gy Parana (Machabo) River, Brazil. This tribe of Indians was absolutely unknown. I was the first person to come into contact with them. The Gy Parana flows into the Madeira." (Miller.)

NOTES FROM CORRESPONDENTS ABROAD.

Rev. W. M. Hayes writes from Tsingchowfu, Shantung, China, May 25, 1914. "I do not know whether Mr. Meyer, when through this section, secured specimens of the Chinese winter pear or not. We are eating them on the table every day now, and they will last some time yet. This variety is really not ripe until the next spring after it is picked, and while not as luscious as a good apple, yet it fills a vacancy in April and May very acceptably. As you know that is a season when the housewives find it difficult to provide for the table.

"Thanks for what you say about peach grafting: the Chinese bud too, but they find grafting more satisfactory because it gives quicker results. They do not use grafting wax, but use a heavy ball of clay, as much as they can make adhere to the limb, and tie it on with a species of tough pliant leaves. I find that oiled paper though will do equally well. The point in wrapping the clay with the leaves is to keep it from being washed away in the rains. If the season should be a prolonged dry one, which we are very liable to have here in the spring, then they tear off the top of the wrapping and pour in water enough to moisten the clay again."

Mr. Frank N. Meyer writes from Peking, China, June 4, 1914, suggesting the following tentative itinerary for the coming year. Certain changes in it will no doubt be nec-

essary but in the main he will, it is hoped, be able to carry out this plan. "My plans for leaving for western China are assuming the following shape: from Peking to Chang tö fu, in Northern Honan, by train. Then by carts to Lin hsien; here in the neighboring mountains many rare trees are said to abound, like *Pinus bungeana*, various conifers and others.

"From Lin hsien by pack animals through the wild mountains, to Pai hsiang chen (Shansi) where these large jujubes are cultivated. Here I will try to get photos of green fruits and the orchards in leaf, though it may be too early yet.

"From Pai hsiang chen, we will move on to Sianfu, Shensi. Then probably by the southern route over Föng siang fu to Chow tien (N. Szechuan). Then along the Hei shin ho (black water stream) to Kiai, trying to collect wild peaches (*A. persica* var. *potanini*) and almonds which occur there.

"From Kiai we may go over Siho and Titao to Lanchowfu, Kansu.

"From Lanchowfu I may go to Sining and return by way of Chobsen and Chetertou to Lanchowfu again, passing through regions rich in forests and where Przewalski collected many novelties.

"In late winter (1914) or early spring, 1915, I may leave Lanchowfu, and go by way of Titao, Minchow, Siku, Kungala pass (19000 ft. alt.) to Sungpan (Szechuan). From there to Chengtu and Chungking. Then along the Yang tse Kiang over Wan hsien and Tchang to Hankow. In Szechuan and Hupeh I will make special enquiries regarding woodnut-oil problems and bamboo-manufacture. In May 1915 I may again be in Peking and then leave for America, arriving in Washington possibly before the fiscal year has expired.

"The problems to which special attention will be paid on this coming journey are those connected with jujubes, persimmons, wild peaches, and other wild fruits, bamboos and wood-oil trees. Of course, as usual, I will stumble across lots of things too interesting not to bag them also.

"There are several dark clouds hanging over these proposed journeys. The worst is the brigandage out in N. W. China. Powerful bands of these rascals are still operating in Kansu especially, and at times I am considerably worried by the accounts one finds in the papers. I would hate to lose my whole outfit in an encounter with these scoundrels.

"Another problem is the money question. Will I be able to finance the thing properly? We will try and see and when I do not get robbed, I think we will be able to manage it alright.

"The third difficulty is the one that is always with one, viz., will my new interpreter prove to be up to our desires? All we can do is to hope for the best."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant in charge of Explorers' Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow), Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
W. H. F. Gomme, Assistant Farm Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. H. Harold Hume, Glen St. Mary, Fla.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Mr. William H. Raynes, Tallahassee, Fla.
Mr. J. F. Rock, Honolulu, Hawaii.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 99. **July 1914.**

Genera Represented in This Number.

Allium	38787	Ligustrum	38807
Beta	38883	Mangifera	38981
Brassica	38782-783	Panax	38742-751
Capsicum	38788	Plagianthus	38969
Coix	38868-880	Prunus	38761
Cucurbita	38884		38778
Daucus	38786		38856
Dendrocalamus	38736		38978
Escallonia	38759	Syringa	38828-830
Gleditsia	38800-802	Thuja	38797
Hordeum	38885-887	Toona	38805
Lespedeza	38808-09	Vitis	38853

PLATES: Green Fruited Rubus from Brazil.
The Manga da Rosa or Rose Mango.
A Scene on the Banks of the Rio Sao Francisco.
The Imbu tree (*Spondias tuberosa*) at home.

(NOTE: Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.)

Matter in these multigraphed sheets must not be published without special permission.

Allium schoenoprasum. (Liliaceae.) 38787. Seeds of chives from Sianfu, Shensi, China. "A superior variety of chives, much used, forced in darkness, as a winter vegetable. Eaten with fried meats and as a savory in soups; considered to be very healthful. Might possibly be a profitable crop in America when supplied to the Hebrew and Chinese colonies in eastern American cities. Chinese name 'Tcho tsai'." (Meyer's introduction.)

Beta vulgaris. (Chenopodiaceae.) 38883. Seeds of beet from Esperanza, Sonora, Mexico. Presented by Mr. W. W. Mackie, Director, Yaqui Valley Experiment Station. "Gathered in Merv, Transcaspia, Turkestan, in 1911. These seeds came from selections out of three years of crops during which time, I have had them under observation. The climate for the first part of the year in the Yaqui Valley is very similar to the summer of Turkestan where I obtained these seeds. The beets produced from these seeds are very vigorous, hardy and drought resistant. The leaves are large and tender and are much used for greens in Turkestan. The flesh is tender, sweet and light red color. The root grows to an immense size, and is eaten greedily by stock. For three seasons this beet has regularly produced an abundance of plump seeds of high viability in June from seeds planted in the preceding fall. This seeding of beets the first year from seed sometimes occurs at intervals in individuals when subjected to drought and again irrigated, thus starting a new or second growth but this Turkestan beet produces seed from every beet regularly in June."(Mackie.)

Brassica pekinensis. (Brassicaceae.) 38782-783. Seeds of Chinese cabbage or pai-tsai, from Shantung, China. Two varieties, one "a remarkably fine one, of very white color and possessing a mild, sweet flavor, weighing up to 10 pounds apiece," the other "of conical shape, leaves greenish-white, very soft and tasteful when boiled or stewed. Chinese name 'Ta pai tsai', meaning 'large white vegetable'." (Meyer's introductions.)

Capsicum annuum. (Solanaceae.) 38788. Seeds of red pepper from eitcheng, Shantung, China. "A very elongated variety of Chili pepper, locally much dried and kept for winter use. Is used as a condiment in soups and with noodles, when ground up and mixed with sesame oil and a little salt, creating a good appetite in that way. Chinese name 'Chang lo chiao,' meaning 'long chili pepper'." (Meyer's introduction.)

Coix spp. (Poaceae.) 38868-880. Seed of thirteen varieties of Job's-tears from Burma. Presented by Mr.

H. G. Carter, Economic Botanist to the Botanical Survey of India. Among these are the principal varieties used by the Burmese natives as food grains, for the manufacture of flour, and parched. Introduced for the work of the Office of Forage Crop Investigations.

Cucurbita pepo. (Cucurbitaceae.) 38884. Pumpkin seeds from Esperanza, Sonora, Mexico. Presented by Mr. W. W. Mackie, Director Yaqui Valley Experiment Station. "Gathered in Merv, Transcaspia, in 1911. These seeds came from selections out of three years of crops during which time I have had them under observation. When planted in March immense crops were produced in June. With the beginning of the rainy season in July another crop is planted producing fine crops in December. The soil is a dark red clay. Other pumpkins do not produce such good crops nor do they so well withstand the heat and drought. The rind is hard and greenish in color. It is a good keeper lasting for months in this warm climate." (Mackie.)

Daucus carota. (Apiaceae.) 38786. Seeds of carrot from Sianfu, Shensi, China. "A long blood-red carrot of special value for pickling purpose on account of its attractive color. Thrives best on deep, rich, sandy soils which retain moisture well. Chinese name 'Hong tiao lo ba,' meaning 'red stick root.'" (Meyer's introduction.)

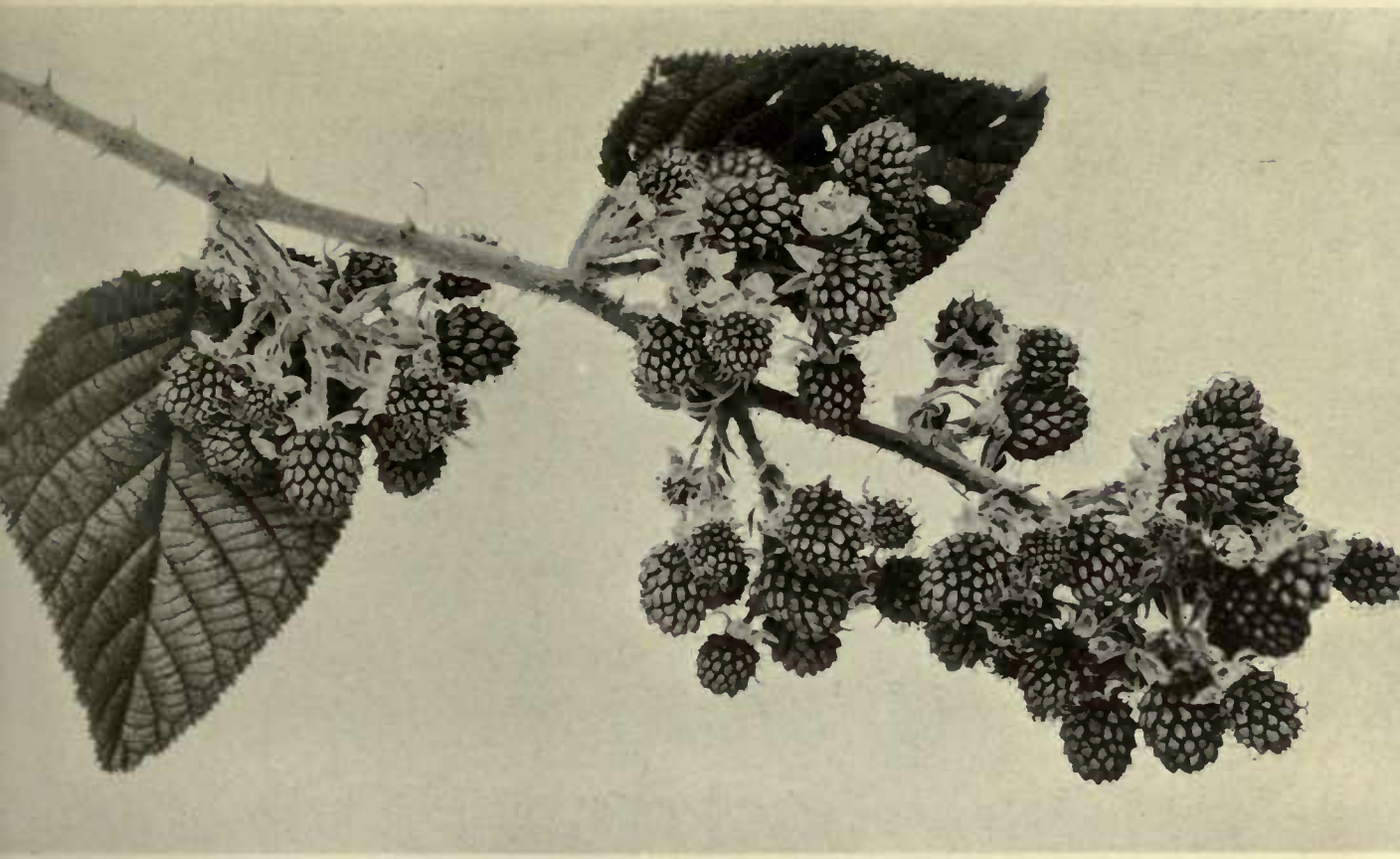
Dendrocalamus hamiltonii. (Poaceae.) 38736. Seeds of a bamboo from Darjeeling, India. Collected by Mr. L. J. Mackintosh at the request of Mr. J. F. Rock, collaborator of this Office. "A common bamboo in the eastern Himalaya from Kumaon to Assam. It is generally a tall grass 40 to 60 feet in height, but sometimes found as a long and tangled bush. The young shoots are used as food, being boiled and eaten in Sikkim, Bhutan, and Assam. The halms are large, 3 to 6 inches in diameter, rather hollow and not always straight, but they are used for every variety of purpose. The bamboo grows gregariously on hillsides up to 3000 feet. This bamboo is used by some tea planters for shading their estates from the hot and violent winds. This bamboo flowers every year which is not the case with all others of this genus." (Watt, Dictionary of Economic Products of India.)

Escallonia pterocladon. (Saxifragaceae.) 38759. Seeds from the Royal Botanic Garden, Kew, England. Presented by the Director. "A small, decidedly hardy, much branched shrub native of western Patagonia, four or five feet high with spreading branches. It is a bushy plant with leaves like a small-leaved myrtle, and abundant very pretty Epacris-like, fragrant flowers tinged with red. The old wood

is clothed with loose, cracked papyraceous bark and the branches are straight, rigid, singularly angled and winged with vertical alae, which are sinuate and downy or fringed at the edge." (Curtis's Botanical Magazine, no. 4827.)

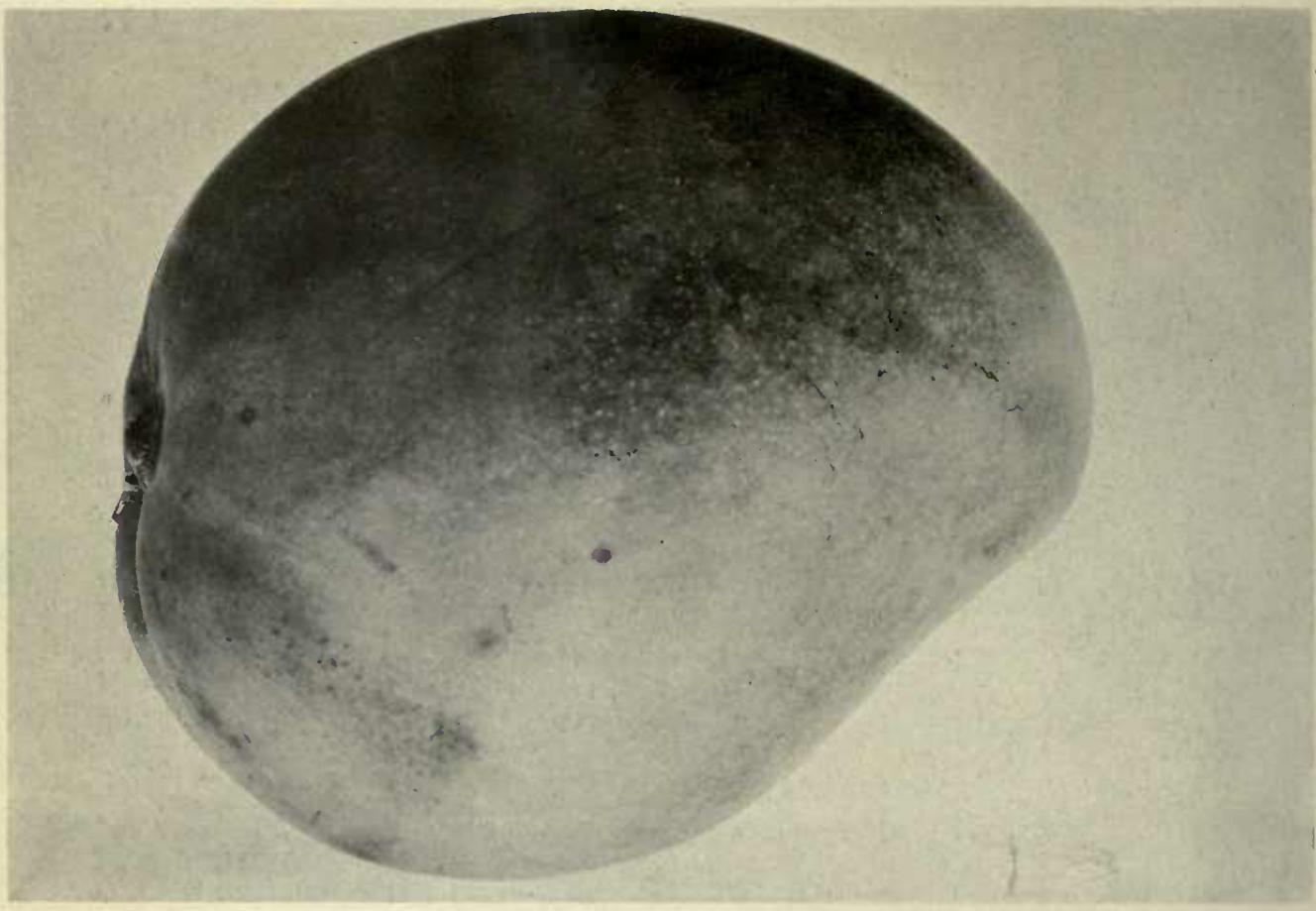
Gleditsia sinensis. (Caesalpiniaceae.) 38800-802. Seeds of three varieties of Chinese soap-bean. "These Chinese Gleditsias often grow to a very large size, becoming quite old and at times making beautiful, well rounded heads of dense branches and foliage. The conspicuous pods persist on the trees all through the winter. They are marvelously drought resistant and do not object to a certain amount of alkali. Recommended as an ornamental park and shade tree for the mild-wintered, semi-arid sections of the United States. The Chinese find use for the pods, when sliced up, as a substitute for soap for washing their hair and certain fabrics. Chinese name 'Tsao chio.' The young trees often have their trunks covered with big spines which often have totally disappeared when the trees are old." (Meyer's introductions.)

Hordeum sp. (Poaceae.) 38885. Seed of barley from Esperanza, Sonora, Mexico. Presented by Mr. W. W. Mackie, Director Yaqui Valley Experiment Station. "White Turkestan barley gathered in Merv, Transcaspia, in 1911. These seeds came from selections out of three years of crops during which time I have had them under observation. The Wahl-Henius Institute of Fermentology, to which a quantity of the seed was sent report as follows: 'The barley itself is of the 6-rowed *nutans* type and has a marked flesh-colored aleurone layer, such as is characteristic of barleys of Asiatic origin, in fact, the flesh colored appearance is more pronounced than we have ever noticed in any similar barley before. This barley really is strange to us. It is irregular in size and form, and has a very low albumen content' (due no doubt to the skinning off of the germ or embryo by too close threshing). 'The taste and flavor are remarkably agreeable. If any of this barley is malted, we should be pleased to receive a five-pound sample of the malt. If this barley could possibly be grown on a rich nitrogenous soil, so that the albumen content could be increased to about 13%, it, in our opinion, would be by far the best barley for malting purposes among the ten samples you sent.' Our field tests show this barley to be very vigorous and hardy with splendid germination. In height it is about 20 to 30% shorter than the common California 6-rowed barley but produces thicker and longer heads. It is nearly three weeks earlier in maturing, in other words it is a quick growing variety. On account of its propensity to rust I would advise that it be planted inland away from the influence of the sea coast and fogs.



A GREEN FRUITED RUBUS FROM BRAZIL.

This species, *Rubus brasiliensis* Mart., occurs in the Highlands of Minas Geraes, where it was collected in 1914 by the Dorsett, Shamel and Popenoe Expedition. The plant grows to a height of six or more feet, and produces its fruits in clusters of good size. It is called by the natives, amora, a name which properly belongs to the mulberry but is also applied to *Rubus rosaefolius* as well as the species here shown. The fruits are translucent yellowish-green when ripe, sweet and agreeable in flavor but rather seedy. For breeders of rubiaceous fruits this species may be of interest and value. Brazilian Expedition Photo No. D 1579, taken at Sitio, Brazil, Jan. 28, 1914.



THE MANGA DA ROSA, OR ROSE MANGO.
(Natural size.)

This unusually beautiful mango, supposed originally to have come from Mauritius, is cultivated on a commercial scale at Pernambuco, and to a less extent in Bahia and other coastal towns of Brazil. It is somewhat fibrous, and perhaps not equal in flavor to some of the Indian mangos now growing in Florida, but its attractive appearance, excellent keeping and shipping qualities have won for it great popularity. In color it is deep apricot, overlain with varying shades of salmon and flame scarlet around the basal end. The flesh is deep yellow in color, juicy, and of a very agreeable flavor. Large quantities are shipped from Pernambuco to Rio de Janeiro and sold there at 65 to 80 cents each. It is one of the few varieties in Brazil which are propagated by inarching. Brazilian Expedition Photograph No. D 1210, taken at Rio, January 2, 1914.

It appears to be entirely suited to the arid irrigated regions of the Southwest. All our grains are grown entirely without rain by the aid of irrigation even to sprouting the seed. White Turkestan yields far better than any other variety tested." (Mackie.)

Lespedeza spp. (Fabaceae.) 38808-809. Seeds from Ta Hua shan, Shensi, China. Two shrubby Lespedezas, "found on rocky mountain sides at elevations from 3000 to 4000 feet above sea level. Of possible value for forage purposes and as a cover shrub on sandy wastes." (Meyer's introductions.)

Ligustrum quihoui. (Oleaceae.) 38807. Seeds of a privet from the mountains near Nan to tchu, Shensi, China. "A privet found in rocky banks and in between pebbles and rocks, growing into a small or medium-sized bush. Bears masses of small black berries, that set off well with the small evergreen foliage. Is much utilized by the Chinese to graft *Olea fragrans* upon. Of value as a hedge and border shrub, especially for the mild-wintered, semi-arid parts of the United States. Chinese name 'Tung ching,' meaning 'Wintergreen.'" (Meyer's introduction.)

Mangifera indica. (Anacardiaceae.) 38981. Cuttings of a mango from Santiago de las Vegas, Cuba. Collected by Mr. Wilson Popenoe, of this Office. "*Luisa*, a mango of the Philippine type, of which the parent tree is growing in the Casa Vivienda garden at the Central Nueva Luisa, Jovellanes, Matanzas province. Scions have been taken from the original tree and propagated by Mr. A. H. Van Hermann of this place from whom these cuttings were obtained. The Philippine mangos as found here in Cuba are an entirely distinct race from the other mangos grown on the island. The type can be distinguished from the others grown here by the pale, grayish mahogany color of the young leaves, the venation of the leaves, the slender compressed fruits, terminating in a sharp point at the apex, and the thin husk which surrounds the seed. The Cecil mango of Miami, Florida, is a representative of this race and exhibits the characteristics which are noticeable here in Cuba. The race is believed originally to have come from the Philippines. While there is remarkably little variation among the seedlings of this race there are frequently noticeable differences in the size, brightness of color and flavor of the fruit. *Luisa* is described by Prof. F. S. Earle, who was, I believe, the first to observe it, as a fruit 4 to 5 inches in length, dull yellowish green in color with little fiber and remarkably good flavor. It is considered by Prof. Earle the best mango of the Philippine type which he has seen." (Popenoe.)

Panax quinquefolium. (Araliaceae.) 38742-751. Seeds of ten varieties of ginseng from China. Presented by His Excellency Ts'ao Ju-lin, twice Minister for Foreign Affairs, through Dr. Paul S. Reinsch, American Minister, Pekin, at the request of Mr. Frank N. Meyer. Wild and cultivated varieties from Shengking province, Manchuria.

Plagianthus betulinus. (Malvaceae.) 38969. Seeds from Epsom, Auckland, New Zealand. Presented by Mr. D. Petrie. "A tree, varying from 30 to 60 feet in height, with terminal panicles of white flowers. The young shrub forms a mass of tortuous interlacing branches." (Laing and Blackwell, Plants of New Zealand.) "This tree is from the southern part of our colony and should be hardy enough for your lowlands. The tree is dioecious and it would be interesting to note how many turn out male and how many female. The tree naturally grows on alluvial flats and by the side of streams that meander through such stations. I doubt if it would thrive anywhere else." (Petrie.)

Prunus armeniaca. (Amygdalaceae.) 38778, 38978. Seeds of an apricot from Somma Vesuviana, Italy. Presented by Dr. Gustav Eisen, Rome. "Pelese apricot. Size large, slightly ovoid. Deep crease between the cheeks, one of which is larger than the other. Skin smooth, without spots. Color, orange chrome, with carmine flush. Seed medium, with a small projection or hump. Flesh very firm, ripens evenly all around and shows no unripe side. Flavor very fine. Sweetness medium (the specimen having been picked while unripe.) Leaves pointed. I consider this apricot one of the finest if not the finest I have come across. It should be a splendid shipper, and if the sweetness is increased by allowing the fruit to ripen more, it should prove a very desirable table fruit, superior to the Royal. An average fruit displaced 53 cubic cm. water, when immersed in a graduate." (Eisen.)

Prunus sargenti. (Amygdalaceae.) 38761. Seeds from the Arnold Arboretum, Jamaica Plain, Mass. Presented by the Director, Dr. C. S. Sargent. "This species is considered by Wilson valuable as a stock for Japanese cherries." (Sargent.)

Prunus tomentosa. (Amygdalaceae.) 38856. Seeds from Pekin, China. About 125 pounds of stones of the north Chinese bush-cherry, a fruiting shrub of great promise for the cooler, semi-arid sections of the United States. Chinese name 'Suan tau'r' or 'Suan ying tau'r,' meaning 'sour cherry.'" (Meyer's introduction.)

A SCENE IN THE VALLEY OF THE RIO SAO FRANCISCO.

This photograph, which was taken near the village of Urubu, in the state of Bahia, a short distance from the river, shows the general character of this upland region, with its flat plains sparsely covered with vegetation, and occasional round topped hills. The compact shrubs in the foreground, on one of which clothes have been hung to dry, are *Annona spinescens*, a rare, spiny species whose soft, oval, brownish-orange fruits were previously unknown to science. The dugout canoe is the chief means of transportation in this region, though communication with the outside world is maintained through the small river steamers which ply between Joazeiro, in Bahia state, and Pirapora, 1300 kilometers upstream in Minas Geraes. The people are of a mixed Indian and negro blood, unprogressive, with only the hoe, the brush hook, and the facao or heavy knife to carry on their agricultural pursuits, which are limited to the cultivation of mandioca, maize, sugar cane, and a few other crops. Brazilian Expedition photograph No. D 1916. Taken February 17, 1914.

THE IMBU TREE AT HOME.

In the dry interior of northeastern Brazil the imbu (*Spondias tuberosa* Arruda) is one of the most important fruits. The tree grows wild throughout the dry lands or catingas and produces abundant crops of golden yellow fruits the size of a plum. It can nearly always be distinguished from other plants on the catinga, even at a distance, by its broad, spreading form. The specimen here shown is growing near the town of Bom Fim, in Bahia state. A native has taken advantage of the shelter from the sun's rays offered by this tree and built his hut close to the trunk. Brazilian Expedition Photo No. D 2097, taken at Bom Fim, Bahia, Feb. 27, 1914.

Syringa spp. (38828-830. Seeds of lilacs from Shensi, China. One "A tree lilac, found in great masses here and there on rocky mountain slopes, at elevations between 3000 and 5000 feet above sea level. Of value as a stock for 'standard' lilacs and for hybridization purposes." Another "A small lilac of very sturdy growth, found in rocky cliffs at elevations from 4000 to 6000 feet. Of value for the northern sections of the United States as a garden and park shrub." (Meyer's introductions.)

Thuja orientalis. (Pinaceae.) 38797. Seeds of arbor-vitae from Chao yi hsien, China. "A remarkable form of the oriental arbor-vitae, of flattened-globular shape and of very dense growth. A rare tree. Of value for cemeteries and for places of dignity. Specially suited to mild-wintered, semi-arid climes." (Meyer's introduction.)

Toona sinensis. (Meliaceae.) 38805. Seeds from Changli, Chihli, China. Collected by Mrs. Mary Clemens, from whom they were secured by Mr. Frank N. Meyer, Agricultural Explorer. "The well known Chinese cigar-box wood, *Cedrela sinensis*, of which the Chinese eat the young sprouts like spinach. The trees become quite old, grow to large size and withstand drought and alkali to a considerable extent. Recommended as a shade and avenue tree for the mild-wintered sections of the semi-arid belt in the United States. Chinese name 'Hsiang chun shu,' meaning 'sweet chun tree.'" (Meyer's introduction.)

Vitis tiliaefolia. (Vitaceae.) 38853. Cuttings from a wild grape from Herradura, Pinar del Rio, Cuba. "A vigorous, rapid-growing vine, occurring in the mountains of this province. These cuttings were obtained from a plant growing in the garden of Prof. F. S. Earle, who considers the species to be of great interest and value for use in developing a race of grapes which can be successfully grown in strictly tropical regions, and he recommends that careful attention be devoted to the hybridization of this species with some of the northern cultivated grapes. In Prof. Earle's garden the vine has completely covered a cashew tree 20 or 25 feet in height, and produces fruit very similar in appearance to the wild grape of the north. The bunches are 3 to 5 inches in length, loose, the berries deep purple in color and about three-eighths of an inch in diameter. They are used here for making jelly and grape juice." (Popenoe's introduction.)

NOTES FROM CORRESPONDENTS ABROAD.

Dr. George V. Perez writes from Santa Ursula, Tenerife. "In our beautiful climate trees will flower and fruit in

less than three years after planting. The frost and cold weather so prevalent in winter in such parts of the world as California, Florida, and the Mediterranean basin make us realise how superior our climate is to all the above mentioned, for here such a thing as a frost below 2000 feet above sea level is an unheard of thing, and yet in summer the maximum temperatures are much below that recorded in all the climates alluded to. No wonder these were called by the ancients the Fortunate Islands. I beg to inclose three small packets of Echium seeds, *E. pininana*, *E. wildpretii*, and *E. perezii* Sprague. The last is a new species which I had sent you about two years ago under the mistaken name of *E. pininana*, it is very like *E. wildpretii*. You ought to endeavor to raise plants of *E. pininana* which is a very rare plant indeed. All these plants are very remarkable, being most ornamental and attractive to bees and some of them as I have told you before are good forage. Since I speak of bees allow me to call your attention to our mountain broom, *Cytisus supranubius*, also called *Cytisus fragrans*, which is, as far as I know, the plant that gives the best honey in the world. Its habitat is the high plateau of Tenerife, surrounding the Peak, and it grows between 6000 and 10000 feet above the sea level in an excessively dry climate, with very cold nights and hot days. The winter temperature often falls at night to 10° Cent. below zero. I venture to suggest that this plant can be tried in many parts of California, where there are frosts. Oddly enough it has the same habitat as *Echium wildpretii*, which as I have told you before is the hardiest of our Echiums."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in Charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant in Charge of Explorers' Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow), Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
W. H. F. Gomme, Assistant Farm Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. H. Harold Hume, Glen St. Mary, Fla.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Mr. William H. Raynes, Tallahassee, Fla.
Mr. J. F. Rock, Honolulu, Hawaii.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS.

No. 100. August 1914.

Genera Represented in this Number.

Acacia	38991	Indigofera	39119
Aconitum	38993	Jasminum	39120
Aesculus	39102	Meconopsis	39022
Albizzia	38996	Pedicularis	39031-037
	39103-104	Picrorhiza	39041
Amoora	38998	Piptanthus	39043
Betula	39002		39126
Corylus	39106	Polygonum	39048
Cotoneaster	39008	Rheum.	39049-050
Dillenia	39109	Rhododendron	39051-068
Eriobotrya	39111	Saxifraga	39074.
Ficus	39113	Sorbus	39133-135
Fraxinus	39014	Vaccinium	39141
	39115		

PLATES:

Bamboo Tables and Baskets. Bamboo Shop.
Bamboo Utensils. Fruit Merchant.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care fot it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.

PERMISSION TO PUBLISH ON APPLICATION ONLY.

PLANT INTRODUCTIONS.

No. 100. August 1914.

Genera Represented in this Number.

Acacia	38991	Indigofera	39119
Aconitum	38993	Jasminum	39120
Aesculus	39102	Meconopsis	39022
Albizzia	38996	Pedicularis	39021-027
	39107-104	Pieris	39041
Amaora	38998	Tulipa	39043
Betula	39002		39126
Corylus	39103	Polygonum	39046
Cotoneaster	39008	Rheum	39049-050
Dillenia	39109	Rhododendron	39051-056
Embothrya	39111	Saxifraga	39074
Picea	39113	Sorbus	39127-135
Prunus	39014	Vaccinium	39141
	39115		

PLATES:

Bamboo Tables and Baskets. Bamboo Shop.
Bamboo Utensils. Fruit Merchant.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experiments, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.

PERMISSION TO PUBLISH OR APPLICATION ONLY.

Among the plant introductions during August, the most interesting and important, perhaps, are two large collections of seed received from Darjeeling, in the Sikkim Himalayas. One of these collections was made under the supervision of Mr. G. H. Cave, Director of the Lloyd Botanic Garden, at the request of Mr. Wilson Popenoe, of this Office, and the other by Mr. L. J. Mackintosh, at the request of Mr. J. F. Rock of Honolulu, traveling as a collaborator of this Office. Many of the plants are of interest, several are quite new to this country, and one or two perhaps may prove quite worthy of continued cultivation in this country. All plants listed in this bulletin therefore are from Darjeeling, and the descriptions given are from Watt's Dictionary of the Economic Products of India, or Hooker's Flora of British India, unless otherwise specified.

Acacia catechu. (Mimosaceae.) 38991. Seeds of the cutch from Darjeeling, India. The various forms of the cutch tree all yield a gum, an astringent extract and a useful timber. The gum is of pale yellow color and often occurs in tears one inch in diameter. It is sweet to the taste, soluble in water, and forms a strong, pale-colored mucilage. Most of the superior qualities of gum arabic, especially those of south India, are very possibly obtained from this species of Acacia. The timber has yellowish-white sapwood, eith heartwood either dark or light red, and extremely hard. It seasons well, takes a fine polish, and is extremely durable. It is used for all kinds of agricultural implements, wheelwrights' work, etc. In Burma it is used for house posts and very largely as fuel for the steamers of the Irrawaddy flotilla. The fuel of dead cutch or khair is much valued by goldsmiths. In northern India cutch wood is made into charcoal, and is regarded as one of the best woods for that purpose. It has been pronounced good for railway sleepers. A cubic foot of the wood weighs from 50 to 75 pounds according to the variety. The tree is chiefly important as furnishing the astringent catechu, so largely used in tanning. This is extracted from the chips by means of boiling water, the heartwood only being used. The necessitates the complete destruction of the trees, so that the Gujarat method of lopping the larger branches seems more economical and likely to recommend itself for general use.

Aconitum ferox. (Ranunculaceae.) 38993. Seeds of monks-hood from Darjeeling, India. One of the numerous forms of the so-called "Nepal aconites", so largely used in Indian medicine. Of interest possibly for trial in this country as a producer of aconite, since this group of the genus furnishes a poison of unusual strength.

Aesculus assamicus. (Aesculaceae.) 39102. Seeds from Darjeeling, India. "A moderate-sized deciduous tree, found in northern Bengal, in the Khasia Hills, Assam, and Burma, ascending to 4000 feet. The leaflets are 5-7, shortly petioled. Panicles narrowly lanceolate, nearly equalling the leaves, lower pedicels longer. Petals white and yellow. The wood is white, soft and close-grained but very rarely used. It weighs about 36 lbs. per cubic foot."

Among the plant introductions during August, the most interesting and important, perhaps, are two large collections of seed received from Darjeeling, in the Sikkim Himalayas. One of these collections was made under the supervision of Dr. G. H. Cave, Director of the Lloyd Botanic Garden, at the request of Dr. Wilson Popenoe, of this Office, and the other by L. J. Leschinsab, at the request of Mr. J. T. Rock of Honolulu, traveling as a collaborator of this Office. Many of the plants are of interest, several are quite new to this country, and one or two perhaps may prove quite worthy of continued cultivation in this country. All plants listed in this bulletin therefore are from Darjeeling, and the descriptions given are from Watt's Dictionary of the Economic Products of India, or Cooper's Flora of British India, unless otherwise specified.

Acacia catechu. (Mimosaceae.) 38891. Seeds of the catch from Darjeeling, India. The various forms of the catch tree all yield a gum, an astringent extract and a useful timber. The gum is of pale yellow color and often occurs in tears one inch in diameter. It is sweet to the taste, soluble in water, and forms a strong, pale-colored mucilage. Most of the superior qualities of gum arabic, especially those of south India, are very possibly obtained from this species of Acacia. The timber has yellowish-white sapwood, with heartwood either dark or light red, and extremely hard. It seasons well, takes a fine polish, and is extremely durable. It is used for all kinds of agricultural implements, wheelwrights' work, etc. In Burma it is used for house posts and very largely as fuel for the steamers of the Irrawaddy flotilla. The fuel of dead catch or khair is much valued by goldsmiths. In northern India catch wood is made into charcoal, and is regarded as one of the best woods for that purpose. It has been pronounced good for railway sleepers. A cubic foot of the wood weighs from 50 to 75 pounds according to the variety. The tree is chiefly important as furnishing the astringent catechu, so largely used in tanning. This is extracted from the chips by means of boiling water, the heartwood only being used. The necessitates the complete destruction of the trees, so that the Gujarat method of lopping the larger branches seems more economical and likely to recommend itself for general use.

Aconitum ferox. (Ranunculaceae.) 37993. Seeds of monkshood from Darjeeling, India. One of the numerous forms of the so-called "Nepal aconites", so largely used in Indian medicine. Of interest possibly for trial in this country as a producer of aconite, since this group of the genus furnishes a poison of unusual strength.

Aesculus assamicus. (Aesculaceae.) 37902. Seeds from Darjeeling, India. A moderate-sized deciduous tree, found in northern Bengal, in the Khasia Hills, Assam, and Burma, ascending to 4000 feet. The leaflets are 5-7, shortly petioled. Panicles narrowly lanceolate, nearly equalling the leaves, lower pedicels longer. Petals white and yellow. The wood is white, soft and close-grained but very rarely used. It weighs about 35 lbs. per cubic foot."

Albizzia marginata. (Mimoscaeae.) 39104. Seeds from Darjeeling, India. "A large, deciduous, fast growing tree, met with in the sub-alpine tract from the Indus eastward ascending to 4000 feet in Oudh, Bengal, Burma and South India. This tree is attracting considerable attention in Assam. It has been found that tea flourishes better under it than when exposed to the sun. The most favorable explanation of this fact is that the leaves manure the soil; the roots, which do not penetrate deep, tend to open up the soil, while the shade is not so severe as to injure the tea, the leaves closing at night and during the early morning. The gum which flows copiously from the stem is used by the Nepalese for sizing their Daphne paper. The sapwood of this tree is large and white while the heartwood is brown and generally not durable. The wood is used in the manufacture of cart-wheels, wooden bells, and in Bengal it has been tried for tea boxes for which purpose it will probably be well suited."

Albizzia odoratissima. (Mimosaceae.) 38996, 39103. Seeds from Darjeeling, India. "A large deciduous tree, met with in the sub-Himalaya tract from the Indus eastward, ascending to 3000 feet in altitude. This tree yields a dark brown gum in rounded tears, tasteless but soluble in water. The bark is boiled by the Garo people together with the leaves of the dugal (Sarcochlamys pulcherrima) and the yarn of their cloth to give the latter a brownish color. As a medicine the bark is applied externally and is considered efficacious in leprosy and in inveterate ulcers. When boiled in ghi (clarified butter) the leaves are used by the Santals as a remedy for coughs. The timber made from this tree is used in the manufacture of wheels, oil-mills and furniture. The timber is excellent for all purposes requiring strength and durability and is considered one of the most valuable of jungle timbers."

Amoora rohituka. (Meliaceae.) 38998. Seeds from Darjeeling, India. "An evergreen tree with a large crown of branches, which is widely distributed over the Malay Archipelago and the Philippine Islands. The fruit is smooth, pale yellow or red in color, and from one to one and one-half inches in diameter, rather soft and fleshy, three-celled and three-valved. A sort of economic oil is extracted from the seed.

Betula cylindrostachya. (Betulaceae.) 39002. Seeds of a birch from Darjeeling, India. "A pink-barked birch native of the Himalayas and found growing there at altitudes of from 3000 to 10000 feet. It reaches a height of about 60 feet and thrives well along forest streams. The wood is hard, strong and durable." (Mueller, Select Extra Tropical Plants.)

Corylus ferox. (Betulaceae.) 39106. Seeds from Darjeeling, India. "A small tree native of Nepal and Sikkim, found growing at altitudes ranging from 6000 to 10000 feet. The fruit which has an edible kernel is covered with a prickly cup. The wood is pinkish-

white in color, moderately hard and even grained."

Cotoneaster microphylla. (Malaceae.) 39008. Seeds of a cotoneaster from Darjeeling, India. "An ornamental plant recently introduced into Indian gardens. It is known as Khariz luni in Kashmir and as Garri in Kumaon. The wood of this species is used in the manufacture of walking sticks and baskets. When mixed with Parrotia it is used in the construction of twig bridges in Kashmir. The fruit is sweet."

Dillenia pentagyna. (Dilleniaceae.) 39109. Seeds from Darjeeling, India. "A deciduous tree of Oudh, Bengal, Assam, central, South and western India, and Burma. In the younger trees the leaves are sometimes as much as two feet in length and the flowers, buds, and fruit when green are eaten by the natives. The tree flowers in March and April and later produces a berry which is said to have an agreeable acid flavor resembling that of Grewia asiatica. The wood is tough, moderately hard, and of a reddish-grey color. It is used in ship construction, in rice-mills and in the manufacture of charcoal of very good quality. The leaves of this tree are sold in the bazar at Poona as a sub-stratum for thatching."

Eriobotrya petiolata. (Malaceae.) 39111. Seeds from Darjeeling, India. "This tree is a native of the eastern Himalayas and is found growing in Sikkim and Bhotan at elevations of 5000 to 9000 feet. The leaves are firmly coriaceous and vary from 6 to 9 inches in length and from three to three and one-half inches in width. The panicles are from three to six inches in length and broad, branched from the base, very spreading and clothed with a tomentum as are the very young leaves on both surfaces. The flowers are one-half inch in diameter, shortly pedicelled and not crowded." May possibly have some value as a stock for the loquat.

Ficus bengalensis. (Urticaceae.) 39113. Seeds of a fig from Darjeeling, India. "A large tree found in the sub-alpine tract and the lower slopes of Deccan, and so common in Mysore that it may be said to be characteristic of the arboreal vegetation in many parts of that province. This tree attains a height of from 70 to 100 feet, and sends down roots from its branches, thus indefinitely expanding its horizontal growth. This tree yields an inferior rubber and lac is also collected from it. A coarse rope is prepared from the bark and the aerial roots. Paper is also reported to have been formerly prepared in Assam from the bark and to a small extent is still so prepared in Madras. The milky juice is externally applied for pain and bruises, and as an anodyne application to the soles of the feet when cracked or inflamed. It is also applied to the teeth and gums as a remedy for toothache. The wood is of a grayish color, is moderately hard, and as it is durable under water, it is used in the manufacture of well-curbs. It is somestimes used for boxes and door panels."

BAMBOO TABLES AND BASKETS.

The successful growth which the experimental groves or Oriental Bamboo have made in Florida and Louisiana has raised many questions regarding the use of the bamboo canes by the Southern farmers. This Photograph taken by Frank N. Meyer shows a number of low Chinese tables made from bent bamboo, costing only 10 to 15 cents apiece. The woven bamboo baskets, used to wash rice in, cost from 5 to 20 cents apiece. Hua yin miau, Shensi, China. Dec. 27, 1913.

Bamboo Utensils from Shantung, China. Phyllostachys sp.

Cups and jars from bamboo joints, obtained in Tsao chou fu, Shantung, China. Photo by Mr. Frank N. Meyer, Peking, China, April 24, 1914. These utensils, apparently turned on an ordinary lathe, show some of the possibilities of bamboo, not usually considered in this country. It may be that the turning by removing the epidermis makes the dishes less likely to crack in a dry atmosphere. In American steam-heated houses bamboo utensils appear at a decided disadvantage because they dry unevenly and crack. Such as are used for outdoor purposes, however, last a long time, are exceedingly cheap and light and pleasing to look at.

Fraxinus floribunda. (Oleaceae.) 39014, 39115. Seeds of an ash from Darjeeling, India. "This Fraxinus, commonly known as the Nepal ash, is a large deciduous tree found in the Himalayas at altitudes ranging from 5000 to 8500 feet, and attaining a height of 120 feet and a diameter of 5 feet. A concrete, saccharine exudation called manna is obtained from the stem of this tree and is employed as a substitute for the officinal manna. The sugar contained in this exudation, called mannite, differs from cane and grape sugars in not being readily fermentable, though under certain conditions it does ferment and yields a quantity of alcohol varying in strength from 13 to 33 per cent. Like the officinal manna this is used for its sweetening and slightly laxative properties. The wood is white with reddish tinge, soft to moderately hard in structure, resembling in some respects the European ash. The wood is very valuable and is used in the manufacture of oars, jampan poles, ploughs, platters, spinning wheels, and for many other purposes, while the tree itself is a fine avenue ornamental."

Indigofera dosua. (Fabaceae.) 39119. Seeds from Darjeeling, India. "This is a shrub of the temperate, central and eastern Himalayas, from Simla to Bhotan and Assam at altitudes ranging from 6000 to 8000 feet. The flowers of this Indigofera are said to be eaten in Kangra as a pot-herb. This species is prized as fodder for sheep and goats, and buffalos are also said to be very fond of it."

Jasminum humile. (Oleaceae.) 39120. Seeds of a jasmine from Darjeeling, India. "A small, erect, rigid, yellow flowered shrub native of the sub-tropical Himalayas from Kashmir to Nepal, at altitudes of from 2000 to 5000 feet; found also in South India and Ceylon, from 2000 to 6000 feet. It is widely cultivated throughout the gardens of India. In the Kurram valley a yellow dye is extracted from the roots. Like many other jasmines, this species bears flowers, which yield an aromatic essential oil used in native perfumery."

Meconopsis wallichii. (Papaveraceae.) 39022. Seeds from Darjeeling, India. "This is undoubtedly one of the finest of the poppyworts in cultivation. It is an extremely handsome herbaceous perennial, and is remarkable, being one of the few, if not the only true blue-flowered poppy in cultivation at the present time. It attains a height of from 4 to 7 feet and forms a perfect pyramid. It is exceedingly beautiful when in full flower. The blossoms are about three inches in diameter, broadly saucer shaped, pendent and of a lovely shade of blue. The blooms always commence to open at the summit of the stem, then gradually from day to day expand until the lowest and last bud is reached." (The Garden, July 12, 1913.)

Pedicularis spp. (Scrophulariaceae.) 39031-037. Seeds of seven varieties of lousewort from Darjeeling, India. Many of

this interesting genus are handsome perennials suitable for borders' but in cultivation almost all have proven short-lived' perhaps because of some dependence on the root systems surrounding plants in their native habitats.

Picrorhiza kurroa. (scrophulariaceae.) 39041. Seeds from Darjeeling, India. "A low, more or less hairy herb, with a perennial woody, bitter rootstock, common on the alpine Himalayas from Kashmir to Sikkim at altitudes of 9000 to 15000 feet. The root of this species is used in medicines in case of fever and dyspepsia, and as an ingredient of various purgatives."

Piptanthus nepalensis. (Fabaceae.) 39043, 39128. Seeds from Darjeeling, India. "A shrub ten feet high with loose racemes of large yellow flowers, found on the temperate slopes of the Himalayas at an elevation of 7000 to 9000 feet, from Simla to Bhotan."

Polygonum vacciniifolium. (Polygonaceae.) 39048. Seeds from Darjeeling, India. "Apparently a common Himalayan plant which has proved sufficiently hardy to bear the open air of this climate (England). It is a low-growing neat plant, and by its numerous slender stems trailing along the ground and rooting at the joints it soon becomes a spreading compact patch. The leaves are quite concealed by the copious spikes of bright rose-colored flowers, which continue blooming from August to November uninterruptedly. It is well adapted for the front part of rock work, in situations where it will not be subject to drought in summer. This plant continues to become a great favorite in our gardens as a bedding-out plant, especially where autumn flowers are desired." (Curtis's Botanical Magazine, pl. 4622.)

Rheum acuminatum. (Polygonaceae.) 39049. Seeds of wild rhubarb from Darjeeling, India. "This is the common rhubarb of the Sikkim Himalayas, and very closely resembles in most respects the well-known Rheum emodi. It inhabits rocky places, often amongst brushwood in the sub-alpine regions of the Himalayas of Sikkim and East Nepal, at elevations of 9000 to 13000 feet. The stems are pleasantly acid, and, though more dry and stringy than those of R. emodi, may be used for tarts. The root is spongy, and but slightly, if at all, medicinal." (Curtis's Botanical Magazine, pl. 4877.)

Rheum nobile. (Polygonaceae.) 39050. Seeds of wild rhubarb from Darjeeling, India. "A handsome herbaceous plant, with a stem three to four feet high and as thick as the wrist at the base. It is found in the inner ranges of the Sikkim Himalaya at altitudes between 13000 and 15000 feet. The root resembles that of the medicinal rhubarb but is spongy and inert. The acid stems are eaten raw and boiled and the dried leaves afford a substitute for tobacco."

Rhododendron spp. (Ericaceae.) 39051-068. Seeds of eighteen Himalayan rhododendrons from Darjeeling, India. R. campylocarpum and R. dalhousiae, considered as among the most beautiful and interesting of the Himalayan forms, R. anthopogon and R. lepidotum, two species used in Indian medicine, and the rare yellow-flowered R. wightii are among the lot.

Saxifraga purpurascens. (Saxifragaceae.) 39074. Seeds of a saxifrage from Darjeeling, India. "This beautiful and hardy species comes from the temperate regions of the Sikkim Himalaya, where it was discovered growing in wet places at an elevation of from 10000 to 14000 feet. Though closely allied to the Himalayan S. ligulata and the Siberian S. crassifolia, it is extremely different from, and far more beautiful than either of these species. Nothing indeed can exceed the bright glossy green of the leaves which are elegantly margined with red, or the deep, bright, vinous, red-purple of its scape and inflorescence." (Curtis's Botanical Magazine, pl. 5066.)

Sorbus spp. (Malaceae.) 39133-135. Seeds from Darjeeling, India. Three species, all native of the higher Himalayas, and one with small edible fruit. May be of value for stocks for other malaceous fruits.

Vaccinium glauco-album. (Vacciniaceae.) 39141. Seeds from Darjeeling, India. A shrub with large white persistent bracts under the pinkish flowers which are borne in dense racemes, found on the slopes of the Himalayas at an elevation of from 7500 to 10000 feet, from Sikkim to Bhotan.

NOTES FROM CORRESPONDENTS ABROAD.

Frank N. Meyer, Agricultural Explorer, writes from Ping yang fu, Shansi, China, August 1, 1914: "It is about one month ago since I wrote you last and so far as real distance is concerned I have not advanced much, but we went over some very interesting territory and I was luck to discover the real wild peach, growing in loess ravines some 2-3 days to the East from here, near a village called Tchao yu. The plants are of smaller dimensions than our cultivated strains and the stones are somewhat different as regards shape and grooves, but still on the whole there is little difference between a very poor seedling peach and this wild one.

These wild peaches are locally cut for firewood, for the fruits are pretty near inedible, being small and having hard, scurish flesh. They grow at the edges of deep loose ravines and on the steep, sloping bottoms of such ravines, in company with such plants as Pyrus betulaefolia, Hippophae rhamnoides, Prunus armeniaca, Prunus bungei, Xanthoceras sorbifolia, Syringa oblata, Ziziphus sativa, Celtis sinensis, Elaeagnus multiflora. All of these plants are very drought-resistant and do well in semi-arid regions. The Chinese locally do not call this peach "yeh tao or

Bamboo Shop, Sianfu, China.

A bamboo shop on one of the main streets of Sianfu, Shensi, China, making an exhibit of its various wares. Americans have as a rule no conception of the handiness of bamboo timber for the manufacture of many small articles useful around a country home. Such a shop as the above illustrates some of the uses which are made by the Chinese of this peculiar hollow timber. Photo by Mr. Frank N. Meyer, January 18, 1914.

A Fruit Merchant at Tai an fu, Shantung, China.

A fruit merchant sitting at one of the city gates of Tai an fu, selling the fruit of a species of haw (*Crataegus pinnatifida*) of which orchards are often planted in Shantung, China. From these haws one of the best preserves of China is made. The tree has proven hardy in the Eastern United States where it has been distributed. The haws are in the second basket whereas dried persimmons are in the first one. Photo by Mr. Frank N. Meyer, March 20, 1914.

"shan tao" but "mao tao", meaning "hairy peach." In the vicinity where they grow, no peaches are cultivated, although half a day's journey lower down, one meets with some poor looking trees in gardens.

The elevation I found them was almost exactly 4000 feet a.s. I gathered some fruits, but they are not quite ripe; I am trying to ripen them off, however, so that we may obtain at least a few ripe seeds. As a stock however, it has not the value the davidiana peach has, not being as vigorous and apparently being attacked by the same pests that infest cultivated peaches. This "find" is of great interest, however, showing that wild peaches exist much nearer the coast than we suspected and that the peach naturally is a native of semi-arid regions. Whether China is the real home or whether it is only one of the homes of the peach is a question we cannot solve as yet. Will it prove to be that the peach occurs also in Persia and Afghanistan, like the walnut, which is found wild in the Caucasus, Persia, Western China and N. E. China?

There are some more plants occurring here in North Eastern China, which are found also on the other side of the Continent, like the Apricot, Diospyros lotus (Crimea, Caucasus, India, etc.), Ziziphus sativa (North Africa and North China), Buxus sempervirens (Western Caucasus and Western Hupeh), Nelumbium speciosum (Lake Hanka, E. Siberia and Caspian Sea, at mouth of Volga), and on this last trip I have found so much real wild alfalfa on the whole way from Lin hsien in Honan, almost up to this place here and in such out-of-the-way places and so utterly out of reach of men and animals and often in company with other medicagos, like M. lupulina, that we safely can say that the common crawling and spreading strain of Medicago sativa is a real native of this country. The tall, upright form might have been brought from Central Asia, no doubt, as it stated in Chinese chronicles.

We have had some very hard days on that whole trip from Changte fu, over Lin hsien, and Luanfu to here (Ping yang fu), for the whole country, with a few exceptions, is very mountainous and most of our travel had to be done with packmules and the heat!!-- Great Scott! --All our candles are molten together and the sealing wax inside of a small case, within one of my trunks, had fraternized with leadpencils and rubber bands, and the whole thing has become one fantastically looking mass. The alcohol in an iron tin, which is inside a wooden case, became heated, and we had to let the gas pass off to prevent an explosion. Now however I find that this alcohol has been reduced considerably in volume and worse yet it has no strength anymore. The fruit I had in the tin, as peaches, plums, apricots, etc., have all become dissolved and only the stones and some pieces of skin are left on the bottom.

I conclude, therefore, that in the heat of the summer one cannot carry fruits in alcohol with one. This winter I'll try it again.

We had been warned in Luanfu to be very careful, for there was a band of 35 to 40 robbers on the road; well, of course, we carried our firearms all of the time, but luckily we had no encounter and all we saw was a human head hanging in a little wooden

cage, hanging in a wild apricot tree along the roadside and grinning at us with its white teeth, showing partly through the dried-up blackened skin. Beneath the cage there dangled a wooden tablet with the man's name on it, as a warning to other evil-minded mortals.

The whole thing didn't impress us much, for we were passing through a wild and lonely landscape; rugged mountains everywhere and wild apricot trees in full fruit and the five soldiers we had with us a convoy over the bad place and we ourselves also, we would have liked to see some robbers come up and test our strength. As nobody came, however, we turned to the wild apricots, but they were not good enough to satisfy our tastes or quench our thirst.

As you may imagine the stopping places we halted or spent the night at were often the "limit". And oh, those fleas by night and the flies by day! Really, I cannot find any good uses for both these pests in the curriculum of our earth. We also had great difficulty in obtaining sufficient nourishing food. As you know, in summer the Chinese eat exceedingly little meat, and the main food is noodles, from wheaten flour and bird's seed; well a white man cannot derive sufficient strength from such a diet and one does not wish to deplete one's supply of canned goods too rapidly when on such a long trip as this.

My new interpreter and the new coolie are holding out fairly well. The interpreter is by far not as clever as the former one. He is more of an office man; with some training however, we may be able to transform him a bit. Yesterday morning the two were given a beating by some villagers some 10 lis from here and now we are negotiating with the local magistrate to have this beating business returned to the proper parties. I suppose we will be successful at it. So many things here in old China go differently from what they do in other lands.

Now as to my plans. Within a few days I hope to be on the road to Wen hsien and Pai hsiang chen to the South of here, then back to Chiang chou and along the Fen river to the Hoang Ho; by ferry across it and then over Tung kwang to Sianfu. From there on S.W. Shensi and to Kansu for Potanin's wild peaches.

I have collected quite a stack already of herbarium material and as time goes on this will increase many fold these coming months If it now soon will turn colder then everything will be all right.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS.

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to such newly introduced plants as have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 100. August 1914.

Genera Represented in This Number.

Acacia	38991	Indigofera	39119
Aconitum	38993	Jasminum	39120
Aesculus	39102	Meconopsis	39022
Albizzia	38996	Pedicularis	39031-037
	39103-104	Picrorhiza	39041
Amoora	38998	Piptanthus	39043
Betula	39002		39128
Corylus	39106	Polygonum	39048
Cotoneaster	39008	Rheum	39049-050
Dillenia	39109	Rhododendron	39051-068
Eriobotrya	39111	Saxifraga	39074
Ficus	39113	Sorbus	39133-135
Fraxinus	39014	Vaccinium	39141
	39115		

Plates:

Bamboo Tables and Baskets.
Bamboo Utensils.
Bamboo Shop.
Fruit Merchant.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders or others interested.

Permission to publish on application only.

Among the plant introductions during August, the most interesting and important, perhaps, are two large collections of seed received from Darjeeling, in the Sikkim Himalayas. One of these collections was made under the supervision of Mr. G. H. Cave, Director of the Lloyd Botanic Garden, at the request of Mr. Wilson Popenoe, of this Office, and the other by Mr. L. J. Mackintosh, at the request of Mr. J. F. Rock of Honolulu, traveling as a Collaborator of this Office. Many of the plants are of interest, several are quite new to this country, and one or two perhaps may prove quite worthy of continued cultivation in this country. All plants listed in this bulletin therefore are from Darjeeling, and the descriptions given are from Watt's Dictionary of the Economic Products of India, or Hooker's Flora of British India, unless otherwise specified.

Acacia catechu. (Mimosaceae.) 38991. Seeds of the cutch from Darjeeling, India. The various forms of the cutch tree all yield a gum, an astringent extract and a useful timber. The gum is of pale yellow color and often occurs in tears one inch in diameter. It is sweet to the taste, soluble in water, and forms a strong, pale-colored mucilage. Most of the superior qualities of gum arabic, especially those of south India, are very possibly obtained from this species of Acacia. The timber has yellowish-white sapwood, with heartwood either dark or light red, and extremely hard. It seasons well, takes a fine polish, and is extremely durable. It is used for all kinds of agricultural implements, wheelwrights' work, etc. In Burma it is used for house posts and very largely as fuel for the steamers of the Irrawaddy flotilla. The fuel of dead cutch or khair is much valued by goldsmiths. In northern India cutch wood is made into charcoal, and is regarded as one of the best woods for that purpose. It has been pronounced good for railway sleepers. A cubic foot of the wood weighs from 50 to 75 pounds according to the variety. The tree is chiefly important as furnishing the astringent catechu, so largely used in tanning. This is extracted from the chips by means of boiling water, the heartwood only being used. This necessitates the complete destruction of the trees, so that the Gujarat method of lopping the larger branches seems more economical and likely to recommend itself for general use.

Aconitum ferox. (Ranunculaceae.) 38993. Seeds of monkshood from Darjeeling, India. One of the numerous forms of the so-called "Nepal aconites," so largely used in Indian medicine. Of interest possibly for trial in this country as a producer of aconite, since this group of the genus furnishes a poison of unusual strength.

Aesculus assamicus. (Aesculaceae.) 39102. Seeds from Darjeeling, India. "A moderate-sized deciduous tree, found in northern Bengal, in the Khasia Hills, Assam, and Burma, ascending to 4000 feet. The leaflets are 5-7, shortly petioled. Panicles narrowly lanceolate, nearly equalling the leaves, lower pedicels longer. Petals white and yellow. The wood is white, soft and close-grained but very rarely used. It weighs about 36 lbs. per cubic foot."

Albizzia marginata. (Mimoscaeae.) 39104. Seeds from Darjeeling, India. "A large, deciduous, fast growing tree, met with in the sub-alpine tract from the Indus eastward ascending to 4000 feet in Oudh, Bengal, Burma, and South India. This tree is attracting considerable attention in Assam. It has been found that tea flourishes better under it than when exposed to the sun. The most favorable explanation of this fact is that the leaves manure the soil; the roots, which do not penetrate deep, tend to open up the soil, while the shade is not so severe as to injure the tea, the leaves closing at night and during the early morning. The gum which flows copiously from the stem is used by the Nepalese for sizing their Daphne paper. The sapwood of this tree is large and white while the heartwood is brown and generally not durable. The wood is used in the manufacture of cart-wheels, wooden bells, and in Bengal it has been tried for tea boxes for which purpose it will probably be well suited."

Albizzia odoratissima. (Mimosaceae.) 38996, 39103. Seeds from Darjeeling, India. "A large deciduous tree, met with in the sub-Himalaya tract from the Indus eastward, ascending to 3000 feet in altitude. This tree yields a dark brown gum in rounded tears, tasteless but soluble in water. The bark is boiled by the Garo people together with the leaves of the dugal (*Sarcochlamys pulcherrima*) and the yarn of their cloth to give the latter a brownish color. As a medicine the bark is applied externally and is considered efficacious in leprosy and in inveterate ulcers. When boiled in ghi (clarified butter) the leaves are used by the Santals as a remedy for coughs. The timber made from this tree is used in the manufacture of wheels, oil-mills and furniture. The timber is excellent for all purposes requiring strength and durability and is considered one of the most valuable of jungle timbers."

Amoora rohituka. (Meliaceae.) 38998. Seeds from Darjeeling, India. "An evergreen tree with a large crown of branches, which is widely distributed over the Malay Archipelago and the Philippine Islands. The fruit is smooth, pale yellow or red in color, and from one to one

and one-half inches in diameter, rather soft and fleshy, three-celled and three-valved. A sort of economic oil is extracted from the seed.

Betula cylindrostachya. (Betulaceae.) 39002. Seeds of a birch from Darjeeling, India. "A pink-barked birch native of the Himalayas and found growing there at altitudes of from 3000 to 10000 feet. It reaches a height of about 60 feet and thrives well along forest streams. The wood is hard, strong, and durable." (Mueller, Select Extra Tropical Plants.)

Corylus ferox. (Betulaceae.) 39106. Seeds from Darjeeling, India. "A small tree native of Nepal and Sikkim found growing at altitudes ranging from 8000 to 10000 feet. The fruit which has an edible kernel is covered with a prickly cup. The wood is pinkish-white in color, moderately hard and even grained."

Cotoneaster microphylla. (Malaceae.) 39008. Seeds of a cotoneaster from Darjeeling, India. "An ornamental plant recently introduced into Indian gardens. It is known as Khariz luni in Kashmir and as Garri in Kumaon. The wood of this species is used in the manufacture of walking sticks and baskets. When mixed with Parrotia it is used in the construction of twig bridges in Kashmir. The fruit is sweet."

Dillenia pentagyna. (Dilleniaceae.) 39109. Seeds from Darjeeling, India. "A deciduous tree of Oudh, Bengal, Assam, central, south and western India, and Burma. In the younger trees the leaves are sometimes as much as two feet in length and the flowers, buds, and fruit when green are eaten by the natives. The tree flowers in March and April and later produces a berry which is said to have an agreeable acid flavor resembling that of *Grewia asiatica*. The wood is tough, moderately hard, and of a reddish-grey color. It is used in ship construction, in rice-mills and in the manufacture of charcoal of very good quality. The leaves of this tree are sold in the bazar at Poona as a sub-stratum for thatching."

Eriobotrya petiolata. (Malaceae.) 39111. Seeds from Darjeeling, India. "This tree is a native of the eastern Himalayas and is found growing in Sikkim and Bhotan at elevations of 5000 to 9000 feet. The leaves are firmly coriaceous and vary from 6 to 9 inches in length and from three to three and one-half inches in width. The panicles are from three to six inches in length and broad, branched from the base, very spreading and clothed with a rusty

BAMBOO TABLES AND BASKETS.

The successful growth which the experimental groves of Oriental Bamboo have made in Florida and Louisiana has raised many questions regarding the use of the bamboo canes by the Southern farmers. This Photograph taken by Frank N. Meyer shows a number of low Chinese tables made from bent bamboo, costing only 10 to 15 cents apiece. The woven bamboo baskets, used to wash rice in, cost from 5 to 20 cents apiece. Hua yin miau, Shensi, China. Dec. 27, 1913.

PROPERTY OF DIVISION O
FORESTR
COLLEGE OF AGRICULTUR
UNIVERSITY OF CALIFORNIA

Bamboo Utensils from Shantung, China. Phyllostachys sp.

Cups and jars from bamboo joints, obtained in Tsao chou fu, Shantung, China. Photo by Mr. Frank N. Meyer, Peking, China, April 24, 1914. These utensils, apparently turned on an ordinary lathe, show some of the possibilities of bamboo, not usually considered in this country. It may be that the turning by removing the epidermis makes the dishes less likely to crack in a dry atmosphere. In American steam-heated houses bamboo utensils appear at a decided disadvantage because they dry unevenly and crack. Such as are used for outdoor purposes, however, last a long time, are exceedingly cheap and light and pleasing to look at.

tomentum as are the very young leaves on both surfaces. The flowers are one-half inch in diameter, shortly pedicelled and not crowded." May possibly have some value as a stock for the loquat.

Ficus bengalensis. (Urticaceae.) 39113. Seeds of a fig from Darjeeling, India. "A large tree found in the subalpine tract and the lower slopes of Deccan, and so common in Mysore that it may be said to be characteristic of the arboreal vegetation in many parts of that province. This tree attains a height of from 70 to 100 feet, and sends down roots from its branches, thus indefinitely expanding its horizontal growth. This tree yields an inferior rubber and lac is also collected from it. A coarse rope is prepared from the bark and the aerial roots. Paper is also reported to have been formerly prepared in Assam from the bark and to a small extent is still so prepared in Madras. The milky juice is externally applied for pain and bruises, and as an anodyne application to the soles of the feet when cracked or inflamed. It is also applied to the teeth and gums as a remedy for toothache. The wood is of a grayish color, is moderately hard, and as it is durable under water, it is used in the manufacture of well-curbs. It is sometimes used for boxes and door panels."

Fraxinus floribunda. (Oleaceae.) 39014, 39115. Seeds of an ash from Darjeeling, India. "This Fraxinus, commonly known as the Nepal ash, is a large deciduous tree found in the Himalayas at altitudes ranging from 5000 to 8500 feet, and attaining a height of 120 feet and a diameter of 5 feet. A concrete, saccharine exudation called manna is obtained from the stem of this tree and is employed as a substitute for the officinal manna. The sugar contained in this exudation, called mannite, differs from cane and grape sugars in not being readily fermentable, though under certain conditions it does ferment and yields a quantity of alcohol varying in strength from 13 to 33 per cent. Like the officinal manna this is used for its sweetening and slightly laxative properties. The wood is white with reddish tinge, soft to moderately hard in structure, resembling in some respects the European ash. The wood is very valuable and is used in the manufacture of oars, jampan poles, ploughs, platters, spinning wheels, and for many other purposes, while the tree itself is a fine avenue ornamental."

Indigofera dosua. (Fabaceae.) 39119. Seeds from Darjeeling, India. "This is a shrub of the temperate, central and eastern Himalayas, from Simla to Bhotan and Assam at altitudes ranging from 6000 to 8000 feet. The flowers

of this Indigofera are said to be eaten in Kangra as a pot-herb. This species is prized as fodder for sheep and goats, and buffalos are also said to be very fond of it".

Jasminum humile. (Oleaceae.) 39120. Seeds of a jasmine from Darjeeling, India. "A small, erect, rigid, yellow flowered shrub, native of the sub-tropical Himalayas from Kashmir to Nepal, at altitudes of from 2000 to 5000 feet; found also in south India and Ceylon, from 2000 to 6000 feet. It is widely cultivated throughout the gardens of India. In the Kurram valley a yellow dye is extracted from the roots. Like many other jasmines, this species bears flowers which yeild an aromatic essential oil used in native perfumery."

Meconopsis wallichii. (Papaveraceae.) 39022. Seeds from Darjeeling, India. "This is undoubtedly one of the finest of the poppyworts in cultivation. It is an extremely handsome herbaceous perennial, and is remarkable, being one of the few, if not the only true blue-flowered poppy in cultivation at the present time. It attains a height of from 4 to 7 feet and forms a perfect pyramid. It is exceedingly beautiful when in full flower. The blossoms are about three inches in diameter, broadly saucer shaped, pendent and of a lovely shade of blue. The blooms always commence to open at the summit of the stem, then gradually from day to day expand until the lowest and last bud is reached." (The Garden, July 12, 1913.)

Pedicularis spp. (Scrophulariaceae.) 39031-037. Seeds of seven varieties of lousewort from Darjeeling, India. Many of this interesting genus are handsome perennials suitable for borders' but in cultivation almost all have proven short-lived' perhaps because of some dependence on the root systems surrounding plants in their native habitats.

Picrorhiza kurroa.(scrophulariaceae.) 39041. Seeds from Darjeeling, India."A low, more or less hairy herb, with a perennial woody, bitter rootstock,common on the alpine Himalayas from Kashmir to Sikkim at altitubes of 9000 to 15000 feet. The root of this species is used in medicine in case of fever and dyspepsia, and as an ingredient of various purgatives."

Piptanthus nepalensis. (Fabaceae.) 39043, 39128. Seeds from Darjeeling, India. "A shrub ten feet high with loose racemes of large yellow flowers, found on the temperate slopes of the Himalayas at an elevation of 7000 to 9000 feet, from Simla to Bhotan."

Polygonum vacciniifolium. (Polygonaceae.) 39048. Seeds from Darjeeling, India. "Apparently a common Himalayan plant which has proved sufficiently hardy to bear the open air of this climate (England). It is a low-growing neat plant, and by its numerous slender stems trailing along the ground and rooting at the joints it soon becomes a spreading compact patch. The leaves are quite concealed by the copious spikes of bright rose-colored flowers, which continue blooming from August to November uninterruptedly. It is well adapted for the front part of rock work, in situations where it will not be subject to drought in summer. This plant continues to become a great favorite in our gardens as a bedding-out plant, especially where autumn flowers are desired." (Curtis's Botanical Magazine, pl. 4622.)

Rheum acuminatum. (Polygonaceae.) 39049. Seeds of wild rhubarb from Darjeeling, India. "This is the common rhubarb of the Sikkim Himalayas, and very closely resembles in most respects the well-known *Rheum emodi*. It inhabits rocky places, often amongst brushwood in the subalpine regions of the Himalayas of Sikkim and East Nepal, at elevations of 9000 to 13000 feet. The stems are pleasantly acid, and, though more dry and stringy than those of *R. emodi*, may be used for tarts. The root is spongy, and but slightly, if at all, medicinal." (Curtis's Botanical Magazine, pl. 4877.)

Rheum nobile. (Polygonaceae.) 39050. Seeds of wild rhubarb from Darjeeling, India. "A handsome herbaceous plant, with a stem three to four feet high and as thick as the wrist at the base. It is found in the inner ranges of the Sikkim Himalaya at altitudes between 13000 and 15000 feet. The root resembles that of the medicinal rhubarb but is spongy and inert. The acid stems are eaten raw and boiled and the dried leaves afford a substitute for tobacco."

Rhododendron spp. (Ericaceae.) 39051-068. Seeds of eighteen Himalayan rhododendrons from Darjeeling, India. *R. campylocarpum* and *R. dalhousiae*, considered as among the most beautiful and interesting of the Himalayan forms, *R. anthopogon* and *R. lepidotum*, two species used in Indian medicine, and the rare yellow-flowered *R. wightii* are among the lot.

Saxifraga purpurascens. (Saxifragaceae.) 39074. Seeds of a saxifrage from Darjeeling, India. "This beautiful and hardy species comes from the temperate regions of the Sikkim Himalaya, where it was discovered growing in wet

places at an elevation of from 10000 to 14000 feet. Though closely allied to the Himalayan *S. ligulata* and the Siberian *S. crassifolia*, it is extremely different from, and far more beautiful than either of those species. Nothing indeed can exceed the bright glossy green of the leaves which are elegantly margined with red, or the deep, bright, vinous, red-purple of its scape and inflorescence." (Curtis's Botanical Magazine, pl. 5066.)

Sorbus spp. (Malaceae.) 39133-135. Seeds from Darjeeling, India. Three species, all native of the higher Himalayas, and one with small edible fruit. May be of value for stocks for other malaceous fruits.

Vaccinium glauco-album. (Vacciniaceae.) 39141. Seeds from Darjeeling, India. A shrub with large white persistent bracts under the pinkish flowers which are borne in dense racemes, found on the slopes of the Himalayas at an elevation of from 7500 to 10000 feet, from Sikkim to Bhotan.

NOTES FROM CORRESPONDENTS ABROAD.

Frank N. Meyer, Agricultural Explorer, writes from Ping yang fu, Shansi, China, August 1, 1914: "It is about one month ago since I wrote you last and so far as real distance is concerned I have not advanced much, but we went over some very interesting territory and I was lucky to discover the *real wild peach*, growing in loess ravines some 2-3 days to the East from here, near a village called *Tchao yu*. The plants are of smaller dimensions than our cultivated strains and the stones are somewhat different as regards shape and grooves, but still on the whole there is little difference between a very poor seedling peach and this wild one.

These wild peaches are locally cut for firewood, for the fruits are pretty near inedible, being small and having hard, sourish flesh. They grow at the edges of deep loose ravines and on the steep, sloping bottoms of such ravines, in company with such plants as *Pyrus betulaefolia*, *Hippophae rhamnoides*, *Prunus armeniaca*, *Prunus bungei*, *Xanthoceras sorbifolia*, *Syringa oblata*. *Ziziphus sativa*, *Celtis sinensis*, *Elaeagnus multiflora*. All of these plants are very drought-resistant and do well in semi-arid regions. The Chinese locally do not call this peach "yeh tao or "shan tao" but "mao tao," meaning "hairy peach." In the vicinity where they grow, no peaches are cultivated, although half a day's journey lower down, one meets with some poor looking trees in gardens.

Bamboo Shop, Sianfu, China.

A bamboo shop on one of the main streets of Sianfu, Shensi, China, making an exhibit of its various wares. Americans have as a rule no conception of the handiness of bamboo timber for the manufacture of many small articles useful around a country home. Such a shop as the above illustrates some of the uses which are made by the Chinese of this peculiar hollow timber. Photo by Mr. Frank N. Meyer, January 18, 1914.

A Fruit Merchant at Tai an fu, Shantung, China.

"A fruit merchant sitting at one of the city gates of Tai an fu, selling the fruit of a species of haw (*Crataegus pinnatifida*) of which orchards are often planted in Shantung, China. From these haws one of the best preserves of China is made. The tree has proven hardy in the Eastern United States where it has been distributed. The haws are in the second basket whereas dried persimmons are in the first one. Photo by Mr. Frank N. Meyer, March 20, 1914.

The elevation I found them was almost exactly 4000 feet a. s. I gathered some fruits, but they are not quite ripe: I am trying to ripen them off, however, so that we may obtain at least a few ripe seeds. As a stock however it has not the value the *davidiana* peach has, not being as vigorous and apparently being attacked by the same pests that infest cultivated peaches. This "find" is of great interest however, showing that wild peaches exist much nearer the coast than we suspected and that the peach naturally is a native of semi-arid regions. Whether China is the real home or whether it is only one of the homes of the peach is a question we cannot solve as yet. Will it prove to be that the peach occurs also in Persia and Afghanistan, like the walnut, which is found wild in the Caucasus, Persia, Western China and N. E. China?

There are some more plants occurring here in North Eastern China, which are found also on the other side of the Continent, like the Apricot, *Diospyros lotus* (Crimea, Caucasus, India, etc.), *Ziziphus sativa* (North Africa and North China), *Buxus sempervirens* (Western Caucasus and Western Hupeh), *Nelumbium speciosum* (Lake Hanka, E. Siberia and Caspian Sea, at mouth of Volga), and on this last trip I have found so much real wild alfalfa on the whole way from Lin hsien in Honan, almost up to this place here and in such out-of-the-way places and so utterly out of reach of men and of animals and often in company with other medicagos, like *M. lupulina*, that we safely can say that the common crawling and spreading strain of *Medicago sativa* is a real native of this country. The tall, upright form might have been brought from Central Asia, no doubt, as is stated in Chinese chronicles.

We have had some very hard days on that whole trip from Changte fu, over Lin hsien, and Luanfu to here (Ping yang fu), for the whole country, with a few exceptions, is very mountainous and most of our travel had to be done with packmules and the heat!--Great Scott!--All of our candles are molten together and the sealing wax inside of a small case, within one of my trunks, had fraternized with leadpencils and rubber bands, and the whole thing has become one fantastically looking mass. The alcohol in an iron tin, which is inside a wooden case, became heated, and we had to let the gas pass off to prevent an explosion. Now however I find that this alcohol has been reduced considerably in volume and worse yet it has no strength anymore. The fruit I had in the tin, as peaches, plums, apricots, etc., have all become dissolved and only the stones and some pieces of skin are left on the bottom.

I conclude, therefore, that in the heat of the summer one cannot carry fruits in alcohol with one. This winter I'll try it again.

We had been warned in Luanfu to be very careful, for there was a band of 35 to 40 robbers on the road; well, of course, we carried our firearms all of the time, but luckily we had no encounter and all we saw was a human head hanging in a little wooden cage, hanging in a wild apricot tree along the roadside and grinning at us with its white teeth, showing partly through the dried-up blackened skin. Beneath the cage there dangled a wooden tablet with the man's name on it, as a warning to other evil-minded mortals.

The whole thing didn't impress us much, for we were passing through a wild and lonely landscape; rugged mountains everywhere and wild apricot trees in full fruit and the five soldiers we had with us a convoy over the bad place and we ourselves also, we would have liked to see some robbers come up and test our strength. As nobody came however, we turned to the wild apricots, but they were not good enough to satisfy our tastes or quench our thirst.

As you may imagine the stopping places we halted or spent the night at were often the "limit". And oh, those fleas by night and the flies by day! Really, I cannot find any good uses for both these pests in the curriculum of our earth. We also had great difficulty in obtaining sufficient nourishing food. As you know, in summer the Chinese eat exceedingly little meat, and the main food is noodles, from wheaten flour and bird's seed; well a white man cannot derive sufficient strength from such a diet and one does not wish to deplete one's supply of canned goods too rapidly when on such a long trip as this.

My new interpreter and the new coolie are holding out fairly well. The interpreter is by far not as clever as the former one. He is more of an office man; with some training however, we may be able to transform him a bit. Yesterday morning the two were given a beating by some villagers some 10 lis from here and now we are negotiating with the local magistrate to have this beating business returned to the proper parties. I suppose we will be successful at it. So many things here in old China go differently from what they do in other lands!

Now as to my plans. Within a few days I hope to be on the road to Wen hsien and Pai hsiang chen to the South of here, then back to Chiang chou and along the Fen river to the Hoang Ho; by ferry across it and then over Tung kwang to Sianfu. From there on S. W. Shensi and to Kansu for Potanin's wild peaches.

I have collected quite a stack already of herbarium material and as time goes on this will increase many fold these coming months. If it now soon will turn cooler then everything will be all right.

INDEX OF SCIENTIFIC NAMES OF PLANTS ILLUSTRATED IN PLANT IMMIGRANT BULLETINS, Nos. 1 to 100.

Acrocomia intumescens, Macaúba (2 plates) - - - - - -No. 98
Actinidia sp., Deng-li, 26904 - - - - - - - - - - - -No. 29
" chinensis, Yang tau vine - - - - - - - - - - -No. 50
" " " " flowers- - - - - - - - -No. 50
Aleurites fordii, Chinese Wood Oil tree, 21013- - - -No. 29
" " " " " " " - - - - -No. 76
Amygdalus davidiana, Wild Chinese Peach,22009, 27310-No. 34
" " at Ames, Iowa, 18262 - - - - - -No. 84
" " Hairy peach, 36665 - - - - - - -No. 91
" " Chinese, 36664 - - - - - - - - -No. 91
" persica, Fei peach, 21989 (2 plates) - - -No. 62
" " " " - - - - - - - - - - - -No. 97
Andropogon rufus, Capim Jaragua - - - - - - - - - - -No. 94
Arracacia xanthorrhiza, Arracacha,- - - - - - - - - -No. 75
Artocarpus odoratissimus, Marang, 36256 - - - - - - -No. 89
Atalantia glauca, See Eremocitrus glauca.
Bambos sp. Apparatus for steaming bamboo- - - - - - -No. 32
" Bamboo windbreak - - - - - - - - - - - - - -No. 98
- - - - - - - - - - - - - -No. 54
- - -No. 49
- - -No. 29
- - -No. 35
- - -No. 83
- - -No. 63
- - -No. 65
- - -No. 23
- - -No. 79
- - -No. 47
- - -No. 94
- - -No. 56
- - -No. 53
- - -No. 88
- - -No. 53
- - -No. 97
" " Orchard- - - - - - - - - - - -No. 97
Cudrania tricuspidata, Che tree, 35258- - - - - - - -No. 86
Diospyros kaki, Persimmon, 37648 (2 plates) - - - - -No. 95
Dipterix odorata, See Coumarouna odorata.
Echeveria hoveyi, 28673 - - - - - - - - - - - - - -No. 46
Elaeagnus angustifolia, Oleaster- - - - - - - - - -No. 68
Eremocitrus glauca, Desert kumquat, 29537 - - - - - -No. 57
" " " " 29660 (2 plates) -No. 58
Eucommia ulmoides, Tuchung - - - - - - - - - - - - -No. 64
Eugenia luschnathiana, Pitomba, 37017 (2 plates) - - -No. 93
Feijoa sellowiana, Guayabua, 26120-121- - - - - - - - -No. 38
Feronia elephantum, See Feronia limonia.
Feronia limonia, Wood apple, 29341- - - - - - - - - -No. 55
Haloxylon ammodendron, Saxaul tree, 28976 - - - - - - -No. 51
Jubaea chilensis, Lilla, 28097-098- - - - - - - - - -No. 40
Juniperus foetidissima, Juniper, 27671- - - - - - - - -No. 36

Notice:

This index for Nos. 1 to 100 should be bound with No. 100 of this series.

INDEX OF SCIENTIFIC NAMES OF PLANTS ILLUSTRATED IN PLANT IMMIGRANT BULLETINS, Nos. 1 to 100.

Acrocomia intumescens, Macaúba (2 plates) - - - - - -No. 98
Actinidia sp., Deng-li, 26904 - - - - - - - - - - - -No. 29
" chinensis, Yang tau vine - - - - - - - - - - -No. 50
" " " " flowers- - - - - - - - -No. 50
Aleurites fordii, Chinese Wood Oil tree, 21013- - - -No. 29
" " " " " " " - - - - -No. 76
Amygdalus davidiana, Wild Chinese Peach,22009, 27310-No. 34
" " at Ames, Iowa, 18262 - - - - - -No. 84
" " Hairy peach, 36665 - - - - - - -No. 91
" " Chinese, 36664 - - - - - - - - -No. 91
" persica, Fei peach, 21989 (2 plates) - - -No. 62
" " " " - - - - - - - - - - - -No. 97
Andropogon rufus, Capim Jaragua - - - - - - - - - - -No. 94
Arracacia xanthorrhiza, Arracacha,- - - - - - - - - -No. 75
Artocarpus odcratissimus, Marang, 36256 - - - - - - -No. 89
Atalantia glauca, See Eremocitrus glauca.
Bambos sp. Apparatus for steaming bamboo- - - - - - -No. 32
" Bamboo windbreak - - - - - - - - - - - - -No. 98
" tulda- - - - - - - - - - - - - - - - - - - -No. 54
Belou marmelos, Bael fruit, 28875 - - - - - - - - - -No. 49
Brassica petsai, Pe-tsai- - - - - - - - - - - - - -No. 29
Carica papaya, Paw-paw tree - - - - - - - - - - - -No. 35
" " Simmonds', 28536 - - - - - - - - - -No. 83
Carissa ovata, Black lime bush, 31111 - - - - - - - -No. 63
Casimiroa edulis, White sapote, 31470 - - - - - - - -No. 65
Castanea sp., Hybrid chinquapin, 26230-231- - - - -No. 23
" " Chinese chestnut- - - - - - - - - - -No. 79
Ceratonia siliqua, Carob- - - - - - - - - - - - -No. 47
Chloris elegans, Capim catingueiro- - - - - - - - -No. 94
" gayana, Rhodes grass, 29361 - - - - - - - - -No. 56
Cordeauxia edulis, Yeheb nuts, 29122- - - - - - - -No. 53
Coumarouna odorata, Tonka bean, 35904 - - - - - - -No. 88
Crataegus pinnatifida, Chinese haws, 29103- - - - -No. 53
" " Haw fruits - - - - - - - - -No. 97
" " Orchard- - - - - - - - - - -No. 97
Cudrania tricuspidata, Che tree, 35258- - - - - - -No. 86
Diospyros kaki, Persimmon, 37648 (2 plates) - - - -No. 95
Dipterix odorata, See Coumarouna odorata.
Echeveria hoveyi, 28673 - - - - - - - - - - - - - -No. 46
Elaeagnus angustifolia, Oleaster- - - - - - - - - -No. 68
Eremocitrus glauca, Desert kumquat, 29537 - - - - -No. 57
" " " " 29660 (2 plates) -No. 58
Eucommia ulmoides, Tuchung - - - - - - - - - - - - -No. 64
Eugenia luschnathiana, Pitomba, 37017 (2 plates) - -No. 93
Feijoa sellowiana, Guayabua, 26120-121- - - - - - - -No. 38
Feronia elephantum, See Feronia limonia.
Feronia limonia, Wood apple, 29341- - - - - - - - - -No. 55
Haloxylon ammodendron, Saxaul tree, 28976 - - - - - -No. 51
Jubaea chilensis, Lilla, 28097-098- - - - - - - - - -No. 40
Juniperus foetidissima, Juniper, 27671- - - - - - - -No. 36

Lansium domesticum, Doekoe - - - - - - - - - - - - - - - - -No. 81
" " Langsat- - - - - - - - - - - - - - - - -No. 81
Larix sibirica, Siberian Larch - - - - - - - - - - - - - - -No. 72
Lonicera maackii, Honeysuckle, 33053- - - - - - - - - - -No. 74
Macadamia ternifolia, Queensland nut, 33912- - - - - -No. 78
Machilus nanmu, See Phoebe nanmu.
Malus sp., Wild Apple, - - - - - - - - - - - - - - - - - -No. 66
" sylvestris, Afghasian apple, 27060 - - - - - - - -No. 33
Mangifera indica, Mango- - - - - - - - - - - - - -No. 44, No. 96
" " Manga da Rosa, Rose Mango, 37846 - -No. 99
Melocanna bambusoides, Muli bamboo, 28781- - - - - - -No. 48
Morus alba pyramidalis, Mulberry, 27716- - - - - - - -No. 36
Myrciaria cauliflora, Jaboticaba, 36702, 36709, 36888-No. 92
Myrica nagi, Nagi tree, 26905- - - - - - - - - - - - - -No. 30
Neoglaziovia variegata, Caroá- - - - - - - - - - - - - -No. 71
Nephelium lappaceum, Ramboetan, 22384- - - - - - - - -No. 31
" mutabile, Kapoelasan- - - - - - - - - - - -No. 31
Oryza sp., Perennial Rice, 34092 - - - - - - - - No. 90
Panicum spectabile, Capim de Angola- - - - - - - - - -No. 94
Pasania cornea, Oak, 10633, 27925- - - - - - - - - - -No. 37
Passiflora edulis, Passion fruit (2 plates)- - - - - -No. 52
" ligularis, Passion fruit, 18428 - - - - - -No. 39
Persea americana, Veranero avocado, 35121- - - - - - -No. 85
Phoebe nanmu, Nanmu, 29485 - - - - - - - - - - - - - -No. 57
Phoenix dactylifera, Date culture- - - - - - - - - - -No. 69
" " Menakher date, 29391- - - - - - -No. 56
Phyllostachys pubescens, Mosc bamboo - - - - - - - - -No. 32
Pistacia chinensis, Chinese Pistache,- - - - - - - - -No. 58
" vera, Pistache, 6349- - - - - - - - - - - - -No. 48
Populus diversifolia, Poplar - - - - - - - - - - - - -No. 67
" pruinosa, Pruinose Poplar, 30230, 30921- - - -No. 67
Pouteria caimito, Abiu fruit - - - - - - - - - No. 98
Prunus armeniaca, Apricots,- - - - - - - - - - - - - -No. 51
" avium, Russian Cherry, 32674- - - - - - - - - -No. 73
" fruticosa, Siberian Bush Cherry, 32225-226- - -No. 71
" microcarpa, Wild Cherry, 28946- - - - - - - - -No. 51
" prostrata, Bush Cherry, 28945 - - - - - - - - -No. 51
Quercus cornea, See Pasania cornea.
" suber, Cork oak, 34710 - - - - - - - - - - No. 82
Rollinia orthopetala, Araticu, 27579 - - - - - - No. 77
Rubus sp., Chinese Rasperry, 23346- - - - - - - - - - No. 59
" brasiliensis - - - - - - - - - - - - - - - - -No. 99
Salix sp., Globular headed willow, 17737- - - - - - - - -No. 80
Sesamum orientale, Sesame - - - - - - - - - - - - - - - -No. 61
Solanum muricatum, Pepino, 28899 - - - - - - - - - No. 49
Spondias tuberosa, Imbu tree - - - - - - - - - - - - -No. 99
Strychnos spinosa, 9611- - - - - - - - - - - - - - -No. 62
Ulmus densa, Karagatch tree - - - - - - - - - - - - - -No. 78
Zizyphus jujuba, Jujube, 28764 - - - - - - - - - - - - -No. 47
" " " - - - - - -No. 87, 38243, No. 97

INDEX OF COMMON NAMES OF PLANTS ILLUSTRATED IN
PLANT IMMIGRANT BULLETINS, Nos. 1 to 100.

Abiu fruit, Pouteria caimito ----------No. 98
Angola grass, Panicum spectabile----------No. 94
Apple, Afghasian, Malus sylvestris, 27060 ----------No. 33
" Wild, Malus sp. ----------No. 66
Apricot, Prunus armeniaca ----------No. 51
Araticu, Rollinia orthopetala, 27579----------No. 77
Arracacha, Arracacia xanthorrhiza ----------No. 75
Avocado, Veranero, Persea americana, 35121----------No. 85
Bael fruit, Belou marmelos, 28875 ----------No. 49
Bamboo, Bambos tulda ----------No. 54
Bamboo, Muli, Melocanna bambusoides, 28781----------No. 48
Bamboo, Moso, Phyllostachys pubescens ----------No. 32
Bamboo, Apparatus for steaming----------No. 32
Bamboo windbreak, Bambos sp.----------No. 98
Bulbs, test of home grown versus imported ----------No. 60
Capim d' Angola, Panicum spectabile ----------No. 94
" catingueiro, Chloris elegans ----------No. 94
" Jaragua, Andropogon rufus ----------No. 94
Caroá, Neoglaziovia variegata ----------No. 71
Carob, Ceratonia siliqua----------No. 47
Che tree, Cudrania tricuspidata, 35258----------No. 86
Cherry, Bush, Prunus prostrata, 28945 ----------No. 51
" Siberian Bush, Prunus fruticosa, 32225-226----------No. 71
" Russian, Prunus avium, 32674----------No. 73
" Wild, Prunus microcarpa, 28946----------No. 51
Chestnut, Chinese, Castanea sp.----------No. 79
Chinquapin, Hybrid, Castanea sp., 26230-231 ----------No. 23
Cork oak, Quercus suber, 34710----------No. 82
Date culture, Phoenix dactylifera ----------No. 69
" Menakher, Phoenix dactylifera, 29391 ----------No. 56
Dengli, Actinidia sp., 26904 ----------No. 29
Doekoe, Lansium domesticum----------No. 81
Explorer's Caravan----------No. 70
Fei peach, Amygdalus persica, 21989 ----------No. 62
" " " " ----------No. 97
Guayabua, Feijoa sellowiana, 26120-121 ----------No. 38
Haws, Chinese, Crataegus pinnatifida, 29103----------No. 53
" fruits ----------No. 97
" orchard ----------No. 97
Honeysuckle, Lonicera maackii, 33053----------No. 74
Imbu tree, Spondias tuberosa ----------No. 99
Jaboticaba, Myrciaria cauliflora, 36702, 36709, 36888, No. 92
Jaragua grass, Andropogon rufus----------No. 94
Jujube, Zizyphus jujuba, 28764 ----------No. 47 No. 87
" " " 38243----------No. 97
Juniper, Juniperus foetidissima, 27671 ----------No. 36

Saxaul tree, Haloxylon ammodendron, 28976- - - - - - No. 51
Senegal Rice, Oryza sp. - - - - - - - - - - - - - - No. 90
Sesame, Sesamum orientale- - - - - - - - - - - - - No. 61
Tonka bean, Coumarouna odorata, 35094 - - - - - - - - No. 88
Tu chung, Eucommia ulmoides - - - - - - - - - - - - - - No. 64
Veranero Avocado, Mangifera indica, 35121 - - - - - - No. 85
White Sapote, Casimiroa edulis, 31470- - - - - - - - No. 65
Wood apple, Feronia limonia, 29341- - - - - - - - - - No. 55
Wood Oil Tree, Aleurites fordii - - - - - - - - - - - - No. 29
" " " " " 21013- - - - - - - - - No. 76
Yang tau vine, Actinidia chinensis- - - - - - - - - - No. 50
" " flowers, " " - - - - - - - - - No. 50
Yeheb nut, Cordeauxia edulis, 29122 - - - - - - - - - No. 53

S. P. I. Nos. ILLUSTRATED IN BULLETINS Nos. 1 to 100.

6349 Pistacia vera, Pistache- - - - - - - - - - - - - - No. 48
9611 Strychnos spinosa- - - - - - - - - - - - - - - - No. 62
10633 Pasania cornea, Chinese oak- - - - - - - - - - No. 37
11629 Actinidia chinensis, Yang tau- - - - - - - - - No. 50
17737 Salix sp., Globular headed willow - - - - - - - No. 80
18262 Amygdalus davidiana, Peach - - - - - - - - - - - No. 84
18428 Passiflora ligularis, Passion fruit- - - - - - - No. 39
21013 Aleurites fordii, Wood oil tree- - - No. 29, No. 76
21989 Amygdalus persica, Fei peach- - - - - - - - - No. 62
22009 Amygdalus davidiana, Peach- - - - - - - - - - No. 34
22384 Nephelium lappaceum, Ramboetan- - - - - - - - No. 31
26120-121 Feijoa sellowiana, Guayabua - - - - - - - - No. 38
26230-231 Castanea sp., Hybrid chinquapin - - - - - - No. 23
26904 Actinidia sp.,"Deng-li" - - - - - - - - - - - - No. 29
26905 Myrica nagi, "Nagi tree" - - - - - - - - - - - No. 30
27060 Malus sylvestris, Afghasian apple - - - - - - - No. 33
27310 Amygdalus davidiana, Chinese wild peach- - - - No. 34
27579 Rollinia orthopetala, Araticu - - - - - - - - No. 77
27671 Juniperus foetidissima, Juniper - - - - - - - No. 36
27716 Morus alba pyramidalis, Mulberry- - - - - - - No. 36
27925 Pasania cornea, Oak- - - - - - - - - - - - - - No. 37
28097-098 Jubaea chilensis, "lilla"- - - - - - - - - No. 40
28536 Carica papaya, Simmonds' Papaya- - - - - - - - No. 83
28673 Echeveria hoveyi - - - - - - - - - - - - - - - No. 46
28764 Zizyphus jujuba, Jujube - - - - - - - - - - - - No. 47
28781 Melocanna bambusoides, Muli bamboo - - - - - - No. 48
28875 Belou marmelos, Bael fruit - - - - - - - - - No. 49
28899 Solanum muricatum, Pepino- - - - - - - - - - No. 49
28946 Prunus microcarpa, Wild Cherry - - - - - - - - No. 51
28954 Prunus armeniaca, Apricot - - - - - - - - - - No. 51
28976 Haloxylon ammodendron, Saxaul tree - - - - - - No. 51
29103 Crataegus pinnatifida, Large fruited haws- - - No. 53
29122 Cordeauxia edulis, Yeheb nuts- - - - - - - - - No. 53

29341 Feronia limonia, Wood apple- - - - - - - - - - -No. 55
29361 Chloris gayana, Rhodes Grass- - - - - - - - -No. 56
29391 Phoenix dactylifera, Menakher date- - - - - - -No. 56
29485 Phoebe (Machilus)nanmu, Nanmu - - - - - - - - -No. 57
29537 Eremocitrus (Atalantia) glauca, Desert kumquat No. 57
29660 " " Australian desert kumquat No. 58
30230 Populus pruinosa, Pruinose poplar - - - - - - -No. 67
30921 " " " " - - - - - - -No. 67
31111 Carissa ovata, Black lime bush- - - - - - - - -No. 63
31470 Casimiroa edulis, White sapote- - - - - - - - -No. 65
32225-226 Prunus fruticosa, Siberian Bush Cherry - - -No. 71
32674 Prunus avium, Russian Cherry- - - - - - - - - -No. 73
33053 Lonicera maackii, Honeysuckle- - - - - - - - -No. 74
33912 Macadamia ternifolia, Queensland nut- - - - - -No. 78
34092 Oryza sp., Perennial Rice - - - - - - - - - - -No. 90
35121 Persea americana, Veranero avocado- - - - - - -No. 85
35258 Cudrania tricuspidata, Che tree - - - - - - - -No. 86
35904 Coumarouna odorata, Tonka bean- - - - - - - - -No. 88
36256 Artocarpus odoratissimus, Marang- - - - - - - -No. 89
36664 Amygdalus davidiana, Peach - - - - - - - - - - -No. 91
36665 " " Hairy peach- - - - - - - -No. 91
36702 Myrciaria cauliflora, Jaboticaba - - - - - -No. 92
36709 " " " - - - - - - -No. 92
36888 " " " - - - - - - -No. 92
37648 Diospyros kaki, Persimmon - - - - - - - - - -No. 95
37846 Mangifera indica, Manga da Rosa- - - - - - - - -No. 99
38243 Zizyphus jujuba, Jujube- - - - - - - - - - - - -No. 97

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 101. **September 1914.**

Genera Represented in This Number.

Acrista	39188	Madhuca	39182-183
Aeria	39189	Malus	39145
Balanites	39196	Passiflora	39223-226
Bolusanthus	39300	Persea	39173
Calathea	39190	Prunus	39175
Chloris	39177	Rosa	39186
Claucena	39176	Saccharum	39165
Diospyros	39174	Salix	39191
Holcus	39264-282	Securidaca	39298
Juniperus	39185	Sterculia	39221
Macadamia	39144	Triticum	39227

Plates:

Ginkgo Avenue, Washington, D. C.
Tamarind Avenue, Rio de Janeiro, Brazil.
Chinese Osage Orange, *Cudrania tricuspidata*.
Chinese Flowering Plum, *Prunus triloba*.
Bean Vermicelli from China.
Plant Material Showing Packing Methods.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are filed, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Acrista monticola. (Phoenicaceae.) 39188. Seeds of a palm from Mayaguez, Porto Rico. Presented by Mr. W. E. Hess, Plant Propagator, Porto Rico Experiment Station. "Palma de Sierra. The mountain palm of Porto Rico covers many mountain slopes especially in the eastern part of the island between 2000 and 3000 feet above sea level. It apparently thrives in this very humid cool atmosphere and usually forms a clear stand. This palm greatly resembles *Areca bauerii* grown to a great extent as a decorative palm in greenhouses, and young plants of Acrista are equally attractive. The bud of the mountain palm furnishes a good cabbage, but it is not as sweet as those of the palm. Its black fruits are the size of a cherry and are relished by hogs." (Hess.)

Aeria attenuata. (Phoenicaceae.) 39189. Seeds of the llume palm from Mayaguez, Porto Rico. Presented by Mr. W. E. Hess. "The tallest of Porto Rico palms, reaching a height of 60 to 100 feet. Its foliage resembles that of the royal palm, but is shorter; the trunk never exceeds 6 to 8 inches in diameter. This palm is found only on limestone hills and usually feeds upon nothing but the humus collected in the cracks of these rocks. The large bunches of orange-red berries which are the size of a small cherry are very attractive and are fed to chickens and hogs." (Hess.)

Balanites maughamii. (Simaroubaceae.) 39196. Seeds from Swaziland, Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association, Johannesburg, Transvaal. "The seed is considered a valuable oilseed in those parts of the country in which it grows, that is to say, at altitudes below 1500 feet in the sub-tropical belt, but with comparatively low rainfall, probably not more than 15 inches, this coming during the summer season. The tree is a handsome one though not very large, and should be useful in Florida." (Burt-Davvy.) "This species of Balanites is a native of Portuguese East Africa and may be found growing in the Lebombo Mountains, the Madanda Forest and by the Umbeluzi and Rovuma Rivers. It is a tree which reaches a height of about 50 feet, with irregular shaped bole up to one and two thirds feet in diameter. According to the report of the Imperial Institute, the fruits of *Balanites maughamii* seem unlikely to be of economic value for export use owing to the difficulty of removing the external sugary pulp and extracting the kernel from the thick fibrous shell in which it is enclosed, but may however, be of considerable importance for local consumption. The oil obtained from these kernels is clear, yellow and liquid, possessing no marked smell or taste and having the

following constants: specific gravity, 0.916; saponification value 198.5; iodine value 100. The oil if produced on a commercial scale would probably realize the current price of refined cotton seed oil, but it is thought that the difficulties mentioned above would prevent its production on a large scale. Judging from the localities where this species is known to occur it might be expected to do well in tropical and sub-tropical countries with a well-marked dry season. It would not be advisable to plant it on a large scale, however, until a satisfactory method of extracting the kernel has been devised." (Kew Bulletin, 1914, no. 4, p. 136.)

Bolusanthus speciosus. (Fabaceae.) 39300. Seed from Salisbury, Rhodesia. Presented by Mr. H. Godfrey Mundy, Government Agriculturist and Botanist. An exceptionally beautiful tree, one of the handsomest native South African trees. Said to do well in any region where oranges grow.

Calathea lutea. (Marantaceae.) 39190. Seed of the pampano from Mayaguez, Porto Rico. Presented by Mr. W. E. Hess. "This is one of our finest native foliage plants attaining a height of 10 to 12 feet; its dark green leaf blades are oblong and round at the apex, 4 to 5 feet long and 2 to 3 feet wide. The under side is covered with a blue powder. The graceful curved veins give a characteristic appearance. This plant likes rich soil and plenty of moisture and planted with bananas and other foliage plants near a pond it will rival in beauty any of its neighbors." (Hess.)

Chloris virgata. (Poaceae.) 39177. Seeds of Australian Rhodes grass from Burringbar, New South Wales. Presented by Mr. B. Harrison. Var. *decora*. This grass is a rapid grower and heavy yielder of nutritious fodder. It attains the height of 3 or 4 feet, is relished by stock, and will retain its verdure when other grasses are dried up, and if cut before seeding, makes palatable hay. According to analysis it is one of the richest grasses we possess either imported or indigenous. It is only quite recently that it has come into prominence, principally through the favorable reports from Queensland, where it is said to have succeeded wonderfully in clay-pan, wind-swept, and sun-scorched country where other grasses were difficult to establish. It is, however, a native of this State also, having been identified in 1904, and it will probably succeed even with a lighter rainfall, and under more adverse conditions than the imported varieties, (*C. gayana*, and *C. virgata*) which have a great reputation as drought resisters. The seed is very light, and is carried some distance by

the wind, and the grass spreads rapidly. (Harrison.)

Claucena lansium. (Rutaceae.) 39176. Seeds of the wampi from Hong-kong, China. Presented by Mr. W. J. Tutcher, Superintendent, Botanical and Forestry Department. "A low spineless tree, with spreading branches; leaves spirally arranged, pinnate; leaflets 5-9, ovate-elliptical, 3-5 inches long, petiolate, light green, shiny above; flowers 4-5 parted, small, white, in large terminal panicles; ovary villous, 5-celled with one ovule in each cell; style short; stamens 10; fruit ovate-globose, about one inch long; skin glandular, pubescent; seeds green. The wampi is a native of southern China, where it is commonly grown for its fruits. It is cultivated to some extent in Hawaii and could probably be grown in the warmer parts of Florida and California. It can be grafted on grape-fruit and other species of Citrus, which makes it desirable to test it as a stock for common citrous fruits." (Swingle, in Bailey, Standard Cylopedia of Horticulture.)

Diospyros macrophylla. (Ebenaceae.) 39174. Seeds from the Botanic Gardens, Buitenzorg, Java. Presented by the Director. A wild species of persimmon with small downy fruits for breeding purposes. *Technical description*: "A tree 60 feet high, with dark terete branches. Leaves alternate, oval or oval-oblong, acuminate at apex, rounded or sub-cordate at base, thinly coriaceous, nearly glabrescent below with clear slender arching lateral veins, glabrous above, 3-10 inches long, by one and one-half to four and three-fourths inches wide; petioles one-sixth to one-fourth inches long. Staminate flowers axillary, paniculate, one-fourth inch long, pubescent; panicles many-flowered, one to one and one-half inches long, ultimate pedicels mostly short. Calyx shortly 3-5-fid, globose-urceolate, three-sixteenth inch long, lobes deltoid; corolla silky outside, ovoid in bud, shortly 5-lobed, tube very crass and hard; stamens 12, unequal, in pairs, glabrous. Pistillate flowers in few-flowered cymes, short, calyx 4-5-fid, hairy on both sides, accrescent in fruit; fruit tomentose, sub-globose, one inch or more in diameter. Java, in mountainous places. Local name Kitjallung." (Hiern, Monograph of the Ebenaceae, p. 237, 1873.)

Holcus sorghum. (Poaceae.) 39264-282. Heads of sorghum from Buitenzorg, Java. Presented by Mr. T. E. van der Stok, Chief of the Station for Selection of Annual Crops, Botanic Garden. Nineteen varieties all described as "generally growing in the mountains on a very small scale."

GINKGO AVENUE IN DEPARTMENT OF AGRICULTURE GROUNDS, WASHINGTON, D. C.

This Ginkgo or Maidenhair tree (*Ginkgo biloba*) is a native of Japan and China, related to the Yew tree, bearing a single seeded fruit, the kernel of which is much prized by the Chinese for food. The tree grows to a height of 80 feet, living to be several centuries old. As a street tree it is especially attractive in Autumn when its leaves turn a beautiful golden color. It is the sole survivor of a great genus of trees which inhabited the earth during the time of the prehistoric monsters. A quantity of the seed of this tree has been collected and will be distributed to persons interested.

Juniperus procera. (Pinaceae.) 39185. Seeds of the East African Cedar from Asmara, Africa. Presented by the Director, Government Bureau of Colonization. "A tree ranging in Eritrea from 20 to 25 meters in height, and one meter in diameter, with open oval form; bark split into long narrow strips; branches cylindrical. Leaves scale-like, small, in four series, semioval or lengthened-linear in the same plant. Flowers dioecious. Fruit globose-ovoid or depressed globose, 5-7 mm. in diameter, blackish-blue and pruinose at maturity. In the Altipiano and its foothills from 2200 to 3000 meters height." (Adriano Fiori, Boschi e Piante Legnose dell'Eritrea.)

Macadamia ternifolia. (Proteaceae.) 39144. Seeds from Sydney, Australia. Purchased from Anderson & Co. "A moderate-sized tree, about 40 feet high, with dense dark-green foliage, native of northeastern Australia. It bears very hard nuts of the size of marbles, on spikes 5 to 8 inches long; the nuts are edible and of an agreeable flavor, being much relished in Australia, and sometimes retailed in Sydney at from eight pence to one shilling per pound. The extremely hard shell is the only drawback to these. The tree is propagated by seed; thrives and bears fruit at Peradeniya, where it has been introduced in 1868. Suited to medium elevations." (Macmillan, Handbook of Tropical Gardening.) See Plant Immigrant Bulletin No. 78 for illustration and previous introduction.

Madhuca indica. (Sapotaceae.) 39182. Seeds of this species and *M. longifolia* from the Royal Botanic Gardens, Sibpur, Calcutta, India. Presented by the Superintendent. "It may be said that there are two great products of these trees, (formerly known as *Bassia latifolia*, *B. longifolia*, and *B. malabarica*) seeds. A gum or gutta (the milky sap hardened) flows from incisions or abrasions on the stem. In some parts of the country ringing of the stem is practised just on the setting of the fruits. When this is done the gum may be obtained in abundance. The bark is employed as a dye. The flowers, the oil, the spirit distilled from the flowers, and the bark are all used medicinally. Lastly the timber has some merit, but the trees, as a rule, are too valuable to allow their being killed for this purpose. The mahua shows its leaves from February to April. The cream-colored flowers appear in great clusters (of 30 to 50) near the ends of the branches, from March to April, and are soon followed by the young leaves. Preparatory to the harvest of flowers the people clear the ground below the trees by burning the weeds and smoothing the soil. About March the flowers begin to come to maturity, and every morning just after sunrise the succulent corolla-

tubes fall in showers to the ground. This continues till the end of April, each tree yielding from 2 to 4 maunds (two and one-half to five bushels) of flowers, but usually the fall from a single tree is complete in about 7 to 10 days. A drying-floor is prepared in a position central to a selected batch of trees. The ground is smoothed and beaten; on this the flowers as collected day by day are spread out to dry in the sun. In a few days they shrink in size, change in color to a reddish brown, and their peculiar sweet smell becomes more concentrated and the resemblance to that of mice more intense. But the mahua that is intended for sale is not dried to the same extent as that set apart for home consumption, and naturally so since the loss in weight is considerable. But mahua is eaten extensively while fresh - in the dried form it is cooked and eaten along with rice and other grains or food materials. Before being eaten the dry corolla tubes are beaten with a stick to expel the stamens; the quantity required is then boiled for six hours or so and left to simmer until the water has been entirely evaporated and the mahua produced in a soft juicy condition. Tamarind or sal (*Shorea robusta*) seeds and gram (chick-pea) are frequently eaten along with mahua. By the better classes it is fried with ghi (butter) or with mahua oil. It is extremely sweet, but the power to eat and digest this form of food is an acquired one, so that few Europeans are able to consume more than one flower without having disagreeable after effects. Sometimes the mahua is dried completely, reduced to a powder, and mixed with other articles of food. In that condition it is often baked into cakes. Sugar may also be prepared from the flowers or they may be distilled and a wholesome spirit prepared, the chief objection to which is its peculiar penetrating smell of mice. Nicholls estimated that in the Central Provinces 1,400,000 persons use mahua as a regular article of food, each person consuming one maund (one and one-fourth bushel) per annum, an amount that would set free about one and one-half maunds of grain or about thirty per cent of the food necessities of the people in question. This at the lowest estimate comes to one quarter of a million pounds sterling which the trees present annually to these provinces." (Watt, Commercial Products of India, which see, for discussion of the spirit manufacture, and the use and manufacture of oil and butter from the seeds.)

Malus sp. (Malaceae.) 39145. Scions of apples from Sophia, Bulgaria. Presented by Mr. Alaricus Delmard. "These apples have been found immune from *Schizoneura lanigera* (the wooly aphis.) Dr. Lambreff informs me that he has experimented with these in orchards infested with that pest and while the other varieties all suffered, these have remained immune." (Delmard.)

The Chinese Osage Orange. Cudrania triloba.

"The peculiar looking trunk of a Chinese osage-orange called 'Tcho che shu.' The leaves are occasionally used for feeding silkworms. Locally the small red fruits were considered unwholesome." This species has proven hardy in the Southern States and a hybrid between it and the ordinary osage orange (*Toxylon pomiferum*) was produced in France some years ago. It is a good hedge plant and hogs are fond of the fruits. Photo. No. A 58, by F. N. Meyer, village of Ya tze ko, south of Sianfu, Shensi, China, Jan. 20, 1914.

Chinese Flowering Plum. Prunus triloba.

"A branch of a very large flowering variety of Chinese flowering plum, found growing in the grounds of the German Legation at Peking. This is much cultivated in the gardens of North China and exists in a great many varieties varying in the colors of the flowers from pale pink to a dark violet-rose. Very great variation is found in size, degrees of doubleness, profusion of bloom, time of opening, and the lasting qualities of the flowers. The Chinese in the north always graft or bud this plum on *Amygdalus davidiana*." Photo. No. 988, by F. N. Meyer, Peking, China, April 19, 1914. According to W. J. Bean (Trees and Shrubs Hardy in the British Isles) the double form of this species was introduced by Fortune into England and has become very popular there.

Passiflora maliformis. (Passifloraceae.) 39223-226. Seeds of four varieties of the kuruba from Bogota, Colombia. Presented by Mr. F. L. Rockwood, Clerk of the Legation. "In my opinion the yellow kuruba will be a valuable addition to table fruit in the United States, for it grows in a fresh cool climate, and it is the main market fruit of that class here. The red kuruba is not common and the families that have it think it is the best, but it is not a prolific bearer and not so hardy. A climbing vine, it covers walls, outhouses and small buildings with evergreen, continually bearing fruit. The flowers are very handsome." (Rockwood).

Persea americana. (Lauraceae.) 39173. Seeds of an avocado from Lumija, Chiapas, Mexico. Presented by Mrs. H. H. Markley. "These are slightly pear-shaped, 5-6 inches long, and 10 inches in circumference at the largest point. The skin is very thin, the tree a prolific bearer, growing 40 or more feet high, symmetrical in shape, like a well formed oak. Our temperature ranges from 70 to 100° F." (Markley.)

Prunus avium. (Amygdalaceae.) 39175. Seeds of a cherry from Rome, Italy. Presented by Dr. Gustav Eisen. "Marasca Grossa di Firenze, probably a seedling from Marasca di Piedmonte. Very large, dark brownish black, flesh very firm, very slightly adhering to the stone, which however separates rapidly. Subacid, sweet and slightly astringent. Fine shipper. Suitable both for table and preserves. This cherry is larger than any I have seen in California, and in my opinion of exceptional qualities." (Eisen.)

Rosa abyssinica. (Rosaceae.) 39186. Seeds of a rose from Asmara, Eritrea, Africa. Presented by the Director, Bureau of Colonization. *Technical description.* "An erect or often clambering shrub, glabrous, with spines more or less curved. Leaves of 5-7 membranous, oval or elliptical, acutely serrate, leaflets, with the petiole usually glandular. Flowers corymbose, rarely solitary, with pubescent peduncles, receptacles and calyxes; sepals lanceolate-acuminate, three, with one to three setiform laciniations or without; petals white; style free, projecting. Habit that of *R. sempervirens.*" (Adriano Fiori, Boschi e Piante Legnose dell'Eritrea.)

Saccharum officinarum. (Poaceae.) 39165. Cuttings of a fodder cane from Brisbane, Queensland. Presented by Mr. Leslie Gordon Corrie. "Quacsofoca. The standard fodder cane grown here for stock food purposes and known as the Indian cane. Amongst other seedlings tested for this pur-

pose we have secured one that from all points is an improvement upon the old standard. I am sending some cuttings which you will be able later on to distribute to some of your southern states. We have found it here of superior value from the standpoints of food value, softness, hardiness against low temperatures, and weight per acre. It is a prodigious yielder." (Corrie.)

Salix sp. (Salicaceae.) 39191. Cuttings of a willow from Semipalatinsk, Siberia. Presented by Prof. N. E. Hansen, South Dakota Experiment Station. "Cuttings from small trees I found growing along a creek about eighty miles southwest of Semipalatinsk. This is a very dry region with eight inches of annual rainfall, and the temperature ranging from 50 degrees below zero F. in winter to 106 degrees above in summer. The remarkable characteristic about this willow is that the young shoots can be tied into knots without breaking, so that it should be a good basket willow and good for tying bundles of nursery stock." (Hansen.)

Securidaca longepedunculata. (Asclepiadaceae.) 39298. Seeds from Salisbury, Rhodesia. Presented by Mr. H. Godfrey Mundy, Government Agrostologist and Botanist. "A much-branched shrub eight to ten feet high with violet flowers in terminal racemes, found in Abyssinia, the Mozambique district and in Upper and lower Guinea. The bark of this plant affords the Buaze fiber of Zambesiland." (Oliver, Flora of Tropical Africa.) Of this fiber as early as 1857 i was reported: " The Buaze fiber appears to resemble flax, and as prepared by you (Messrs. Pye Bros. of London) will be equal to flax worth 50 or 60 pounds per ton, but we could hardly speak positively to the value unless we had one or two hundredweight to try on our machinery. However, we think the result is promising, and we hope further inquiry will be made as to the probable supply of the material." Dr. Livingstone states "that the only use it has been put to is in making threads on which the natives string their beads. Elsewhere the split tendons of animals are employed for this purpose. This seems to be of equal strength, for a firm thread of it feels like catgut in the hand, and would rather cut the fingers than break." (Dodge, Fiber Plants.)

Sterculia carthaginensis. (Sterculiaceae.) 39221. Seeds of the anacahuita from Guantanamo, Cuba. Presented by Mr. Juan T. Roig, Botanist, Cuban Experiment Station. "The most popular tree at Guantanamo. From the flowers a decoction is made against cough. The seeds are toasted and eaten like peanuts." (Roig.)

Triticum sp. (Poaceae.) 39227. Seeds of wheat from Bombay, India. Presented by Mr. Henry D. Baker, American Consul, who secured it from Mr. Frank Harrison, Bombay. "This wheat grows wild in Kathiawar, a very dry tract on the west coast of India, north of Bombay. It is said all wheats in existence can be traced back to this stock and that it spreads from India westward via Chaldia (Mesopotamia) and Egypt, thousands of years ago. Natives who eat this wheat, declare it is more palatable and has a better food value than any of the modern varieties grown in India. It has great drought resisting properties and should do well in the arid tracts of the southern states of America. Natives collect this wheat in the jungle, and separate it from the straw by treading, i.e., cattle are made to walk over it in a circle until the grain is separated from the straw. They then pass the grain through hand querns (mills) in order to get rid of the chaff or husk, which is very thick." (Harrison.)

NOTES FROM CORRESPONDENTS ABROAD.

Straits Settlements. Singapore. Mr. I. H. Burkill, Director of the Botanic Garden, writes October 6 in reply to our request for information concerning his new method of shipping mangosteen seeds: "I may tell you that I have young plants growing now from mangosteen seed, which were sent by parcel post to New York and returned through the Dead Letter Office. So I see no reason why we should not get live seed to you." The method according to the Gardeners' Chronicle, consisted first in washing the seeds with a weak carbolic acid solution, and then packing them in moist charcoal previously sterilized with carbolic acid. Seeds of mangosteen treated thus germinated well after a journey extending over 3 months.

China, Lanchowfu. Mr. Frank N. Meyer writes Dec. 10, 1914. "At last I have arrived here in the provincial capital of Kansu and I feel like an old-time sailing ship that has come into port, loaded full with all sorts of things. But the ship has weathered some storms and it is with the loss of the main sail that it is berthed here now. For, and this is a bad thing indeed, my interpreter and the coolie have deserted me cowardly in Siku, for fear of being killed by Tibetans!

My Dutch assistant, however, has stuck faithfully to me, which is a fine thing, for without him I would not have known what to do, as he is much better able to deal with these rough Kansu people than I am myself and understands the dialects so much better than I do.

It gives me pleasure to be able to tell you that I have gotten quite a quantity of seeds of both *Amygdalus potanini* and *A. tangutica*. I have also found new localities for both. *A. potanina* occurs near the village of Tchu tsai tze, one day's journey by packmules, south of Siku, while *A. tangutica* occurs on the right bank of the Siku River, on several places, both South and West of the town of Siku; also here and there between Siku and Minchow; also here and there along the Tao River between Minchow and Kiu cheng (New Taochow) and also around the town of Akanshan, 40 li to the South of Lanchowfu, on the main road to Titao. On this last place there are so many bushes, that whole mountain slides contain nothing else and local people make charcoal from the stumps and the seeds are eaten when boiled and a clear oil is extracted from the kernels.

Of direct economic value, however, these two species are *not*. *A. potanini* is the N. W. China form of *A. davidiana* but the stones are more elongated and differently grooved; the shells are even harder, the kernels smaller and much more elongated and the meat is absolutely inedible, while the skin seems to be more downy even than in *A. davidiana*. The leaves are broader, especially in older trees. The plant assumes a tree-like form when left alone and the local farmers told me they were quite ornamental when in bloom, though this does not last long, this flowering period. I didn't find this Pontanin's peach in very cold or exposed places and from these observations I conclude that it does not stand the chance which its brother, the *davidiana*, does. However it seems to be able to stand more dry heat than the last, for I have found it in some narrow "pockets" in foothill sections on direct South exposure where it certainly must be roasting hot in midsummer; therefore, I suggest it strongly as a stock for almonds especially.

A. tangutica is a variable species of bush almond and though its kernels are bitter and though it throws up a lot of stems and though it is spiny, still I believe it has a decided value as a factor in breeding experiments, for it seems to be very hardy and drought resistant. One finds it mainly on sheltered rocky and loess slopes at elevations from 4000 ft. above sea level up to about 10000 ft. In these higher regions, however, it does not get as cold as one would surmise, for the mountains all around keep off the intense cold.

As a stock for almonds and for other stonefruits I scarcely would recommend this tangut almond since it suckers badly and since these suckers are very hard to remove indeed.

I was lucky enough to find a correspondent near one of these main localities for these almonds. I showed the

"Bean-vermicelli, made from the humble mung-bean, (*Phaseolus radiatus*) hung up to dry in the wind." This is made by soaking the beans for a day or so until quite soft, grinding them between stones while water is dripped over them till a thin milky paste obtained. This paste is washed and sifted in water till all coarse particles are removed. A small portion of the paste is then sifted through a dipper sieve into constantly stirred boiling water, and then transferred quickly into cold water, after which it is hung as shown here on lines to dry. This is much employed in soups in China in the same way as we do noodles. Photo. No. A 2, by F. N. Meyer, Chengchow, Honan, China. Feb. 25, 1914.

One of Mr. Frank N. Meyer's plant shipments ready to be sewn up in cloth and dispatched to Washington from Chengchow, Honan, China. Collectors often do not realize that many species of plants which are not bearing seeds when they are found can be transported to America in the form of cuttings provided they are carefully wrapped up in slightly moist sphagnum moss and covered with waterproof oil paper. Specially prepared directions for sending cuttings will be sent to foreign correspondents on application. Photo. No. A 12, by F. N. Meyer, Feb. 25, 1914.

bushes right on the missionary property, namely, on the grounds of a former Tibetan temple called Lu ba tze and though he was not aware of these things being good for anything but firewood, he now has become much interested in them and for all I know he might have despatched already some seeds for you, for I made the arrangement with him on Nov. 27, 1914, and gave him your address and instructions to send through the American Consul at Shanghai. I may say that the altitude of New Taochow is, by my aneroid 9,400 feet; the climate is semi-arid, the rains falling in the summer, with clear, cold winters in which comparatively little snow falls. The growing seasons are short and local Chinese and Tibetans say that the summers are becoming cooler these last years.

"He will also try to obtain for us seed of the real Moutan peony, which occurs in very inaccessible mountain valleys in Tibet proper, where white men are not allowed to proceed to under ordinary circumstances. He has native helpers, however, who can do such a job.

"In regions West and South West of Siku, heretofore unexplored by white men, I found groves of hazelnut trees growing from 80 ft. to 100 ft. in height (*Corylus tibetica?*) The season for the nuts was passed long ago and the few nuts I collected are probably bad, since the rodents carry away all the good ones. I collected scions, however, which I hope will arrive alive.

"In these same regions we went through groves of magnificent spruces, growing 150 ft. to 200 ft. in height and with trunks 12 to 15 ft. in circumference. I also found a few trees of very peculiar make, standing midway between a chestnut and a hazelnut. Then I noticed a Ribes growing 25 feet in height, *Hippophae rhamnoides* as a tree, 40 ft. tall; splendid *red-barked birches* (*Betula bhojpattra?*) up to 100 ft. in height and stranger yet, clumps of a very hardy small bamboo, *Arundinaria nitida*, growing well in the shade of firs, spruces, red and white birches and covered with snow at elevations from 8,000 to over 10,000 feet above sea level. On one mountain top even tall firs, tree-like Rhododendrons and this bamboo formed an almost impenetrable jungle and this place was just about 10,000 ft. in altitude by my aneroid. I really never had expected to find a bamboo there and in such a company.

"This *Arundinaria nitida* is really not a handsome bamboo, for it is rather leafless and dies off at the tops, the canes grow from a few feet in height up to 40 feet in very favorable localities, with much shelter, they remain very thin, however, more or less in the nature of a reed. The natives, however, use them extensively in the weaving of large mats; in basketry of various forms; as house building material and in the making of strong cables, along

which ferry boats glide on some of the swift flowing mountain streams.

"Well, these are a few things I am mentioning now; later on, when sending off all collected material I'll mention more things.

"I am in a hole, however, as regards a competent Chinese interpreter! I do not know yet what I shall do. Perhaps I'll try to get a young missionary to get along with me. This desertion of my interpreter at such an inopportune place and time has upset all of my plans for the present. And life is so fearfully primitive yet here in Kansu, it is one of the most backward provinces of all China. Food in general is very coarse, houses are badly built, conditions at large are primitive to the extreme and a white man wonders why people are willing to exist only, while it would be so easy to live and to live well indeed.

"Here in this city there is a station of the China Inland Mission with several workers; also a Roman Catholic Mission, with one Father, I think; also an Engish Post master with whom I am acquainted with from Sianfu already, then last but not least, Mr. Farrer, an alpine amateur and his assistant, Wm. Purdom are here."

Darjeeling, India, Mr. L. J. Mackintosh writes Sept. 28, 1914. We have a great number of plants of economic value in these hills and not a few of great medicinal value, some well known in Europe such as Cheritea and Quinine, others again quite unknown. The hill tribes are more successful in combating tropical diseases than some of the qualified doctors. I shall give you one simple example. You know the red *Rhododendron arboreum rufescens*, the hill people use for diarrhea and dysentry. The flowers are gathered and dried in the sun, then stored away for the year. They infuse about ten or twelve petals (dry) in water and take (drink) the first thing in the morning, it being considered the best time. The time however matters but little. I have seen really bad cases, hopelessly neglected or muddled by others cured by this treatment. I could write a whole treatise on the economic value of plants in our district and new to our western readers. Do you think any of these plants could find a field of utility in America? If so I would be most happy to collect seeds of these plants.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant, in charge of Explorer's Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow) Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 102. October 1914.

Genera Represented in This Number.

ERRATUM

Through careless proof reading of page 807, Plant Immigrants, No. 101, September 1914, certain essential words were omitted from the description of *Madhuca indica*. Sixth line, after "*B. malabarica*" insert "the edible flowers and the oil-yielding" before "seeds".

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 102. October 1914.

Genera Represented in This Number.

Acacia	39355	Gliricidia	39331
Achradelpha	39357	Kokia	39354
Annona	39352	Lycopersicon	39362
	39358-359	Manihot	39337-340
Atalantia	39330	Onobrychis	39343
Diospyros	39324	Passiflora	39360
Dolichos	39335	Tibouchina	39333

Plates: Crataegus pinnatifida
Annona
Annona salzmanni

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Acacia horrida. (L.) Willd. (Mimosaceae.) 59355. Seeds of the doornboom or thorntree of South Africa, presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "A glabrous flat-topped tree, usually spreading more than its height. The most widely distributed of all South African trees, extending from Capetown through the Karroo to Damaraland, Orange River Colony, Transvaal, Natal, and Delagoa Bay. Its range is however curiously affected in places, being absent, possibly through frost, in several large flat alluvial localities where single trees have grown to perfection. It ascends to about 4000 feet altitude from the eastern coast and considerably further from the western, but is absent from the higher parts of the Drakenburg, and seldom mixes with Proteaceae, thus indicating that soil as well as climate controls its distribution. Occasionally it forms a fine spreading tree 30-40 feet in height, and with stem 2 feet in diameter, much more frequently it is a small umbrella-shaped tree of 10 to 15 feet in height with a clear bole only to 6 or 8 feet, and the constant regrowth dots or covers the veld with all smaller sizes in suitable localities where it is not kept down. Although usually evergreen, yet in dry cold carroid localities it is often leafless for a considerable part of the year, and in some localities it is continuously leafless for years in succession, and is then enormously spiny and colors the veld white instead of green. In most places its use is principally for fuel, for which purpose there is no better wood; but as this does not, except near the towns, use up all that grows, its increase in remote localities is a difficult matter to check. Fire burns the grass under mature thorn-trees without doing them much damage, and as the seeds germinate most readily after being soaked in boiling water or half roasted, those grass fires aid rather than retard regrowth. Chopping off trees at the ground only induces an abundant coppice growth, but it is found that by chopping them off two feet above ground during summer, the coppice growth is more easily controlled, and the stump often dies. Native locations usually become free of thorntree eventually, partly through the unrestricted native demand for fuel, kraalwood, etc., and partly through the browsing of goats, which of all artificial methods is the surest means of keeping the tree down. A small brown scale-insect, however, (*Prosopophora prosopidis*, var. *mimosae*) is found to kill the trees wholesale on the occasions of its visits in the Bedford district. During very dry winters it is not an uncommon practice to fell a few leafy thorn-trees daily as a green bite for stock; during summer the shade of the spreading tree is sought after by cattle and sheep; young plants are always browsed, and when ob-

tainable the pods are relished by goats; and for scenic effect there is perhaps no prettier tree, growing as it often does on a flat rocky subsoil which will carry no other tree. In alluvial soil it responds freely and gives better growth, on hot rocky banks it is common, but it is never found in high dense forest. Bark rough, thick, dark; formerly much used locally in the tanning of leather, and even now, at about half the price per ton as compared with black wattle, it pays to employ it for local use, but not for export, as the percentage of tannin for the bulk is too low.

"The doorn-boom is the host of an innumerable lot of pests, being often cleared of foliage by caterpillars of several large moths, and by bagwors; its timber is often bored by *Apate dorsalis* and *Chrysobothris dorsata*; certain ants occasionally inhabit the thorns and induce a most thorny development, strange gall abortions or malformations of pods are caused by a fungus; another fungus *OEcidium ornamentale* makes artistic floriated curls of the young twigs; and Loranthus and mistletoe are frequent parasites.

"Doorn-boom makes a strong rough hedge if soaked seed is sown in line and kept watered till germination has taken place. It is also useful for sowing in beds of intermittent rivers with a view to arrest silt during future floods. It suffers severely during soft snowstorms, the horizontal branches and foliage breaking under a heavy weight of snow." (Sim, Forest Flora of Cape Colony.)

Achradelpha mammosa (L.) Cook. (Sapotaceae.) 39357. Seeds of the sapote presented by the Costa Rican National Museum, San Jose. "The sapote has an open crown of large, lanceolate, coarsely-veined, deciduous leaves, and fruit with yellow flesh and a firmer and more uniform texture (than the sapodilla), not crisp like the flesh of an apple, but more like that of a cooked carrot or squash. The triangular-fusiform seeds of the sapote are very large and thick and have the whole inner face covered by an enormous hilum. The sapote is of no commercial importance, though the fruit is used extensively for food by the native populations of Central American regions and the West Indies. It ascends into the plateau regions of Central America." (Adapted from O. F. Cook, Nomenclature of the sapote and the sapodilla, Cont. Nat. Herb., vol. 16, 1913.)

Annona cherimola Miller. (Annonaceae.) 39352, 39359. Seeds of the chirimoya from Bogota, Colombia, presented by Capt. H. R. Lemly, and by Mr. Robert Ancizar of the Colombian Legation. "The principal fruit cultivated by the aboriginal inhabitants of western South America. Endemic in the Andes, and subtropical rather than tropical in its

natural habitat. Fruit with an abundance of slightly acidulous sweet juicy pulp, with a flavor somewhat like that of a pineapple. Recommended for planting in southern California in the foot-hills near the coast." (W. E. Safford.)

Annona purpurea Moç. & Sesse. (Annonaceae.) 39358. Seeds of a soncoya from San Jose, Costa Rica, presented by the Costa Rican National Museum. "This species has large aromatic fruit, velvety on the outside with raised hooked tubercles, yellow aromatic pulp, which is edible when ripe, but said to be unwholesome if eaten to excess. A medium-sized forest tree ranging from Mexico to Panama and Venezuela." (W. E. Safford.)

Atalantia monophylla DC. (Rutaceae.) 39330. Seeds from the Royal Botanic Garden, Calcutta. "A large shrub or small tree, native to India, Ceylon, Burma, Siam, and Indo-China, usually spiny; leaves glabrous, or sometimes pubescent, 1 to 3 inches long; petioles short, slightly or not at all winged; flowers borne in axillary panicles; calyx irregularly lobed, split to the base on one side, petals usually four, stamens eight, the filaments connate and forming a completely closed tube; ovary 3-5 celled; fruit from one-half to three-fourths inch in diameter, with a skin like a lime, globose, with several cells (generally 4), each usually containing one seed and filled with pulp-vesicles, making the fruit much like a miniature orange. This tree, still little known outside of India and Ceylon, is the type of the genus Atalantia, and one of the promising species for trial as a stock on which to graft other citrus fruits, and also for use in breeding new types of citrus fruits. The fruits yield an oil which in India is considered a valuable application in chronic rheumatism." (W. T. Swingle, in Bailey, Standard Cyclopedia of Horticulture.)

Diospyros nigricans Wallich. (Ebenaceae.) 39324. Seeds from Allahabad, India. Presented by Mr. William Bembower, Ewing Christian College. "A tree 50 feet high, with many lax cinereous, glabescent branches; young shoots and petioles minutely puberulous. Leaves oval-oblong, much acuminate at apex, somewhat narrowed at base, alternate, turning black when dry, firmly membraneous, glabrous except on midrib which is puberulous and depressed on the upper surface; lateral veins and net-veins delicate, not conspicuous above; 3-5 inches long by 1-1¾ inches wide; petioles one-tenth to one-seventh inch long. Male flowers in few (3-6)-flowered short axillary puberulous cymes, one-fourth to one-third inch long; bracts small, imbricated. Calyx

with scattered short ferruginous hairs outside, shortly 4-lobed. Corolla with few scattered short hairs outside, deeply (two-thirds) lobed, slender; lobes reflexed at apex. Stamens 32 in one case, very unequal, many minute, glabrous. Fruit glabrous, ovoid or globose, pointed at apex, about two-thirds inch long, 4-celled, 4-seeded, solitary. Fruiting calyx 4-partite, with scattered ferruginous hairs outside, nearly glabrous inside; with oval, flat, spreading or reflexed lobes, one-third inch long. Seeds oblong, two-fifths inch long; albumen not ruminated, embryo nearly as long as the albumen. Fruiting peduncles shortly hispid, one-fifth inch long, patent. unilateral, bearing 2 small bracts. From Khasia, East Bengal, and Silhet." (Hiern, Monograph of the Ebenaceae.) For breeding experiments and to test as a possible stock for the persimmon.

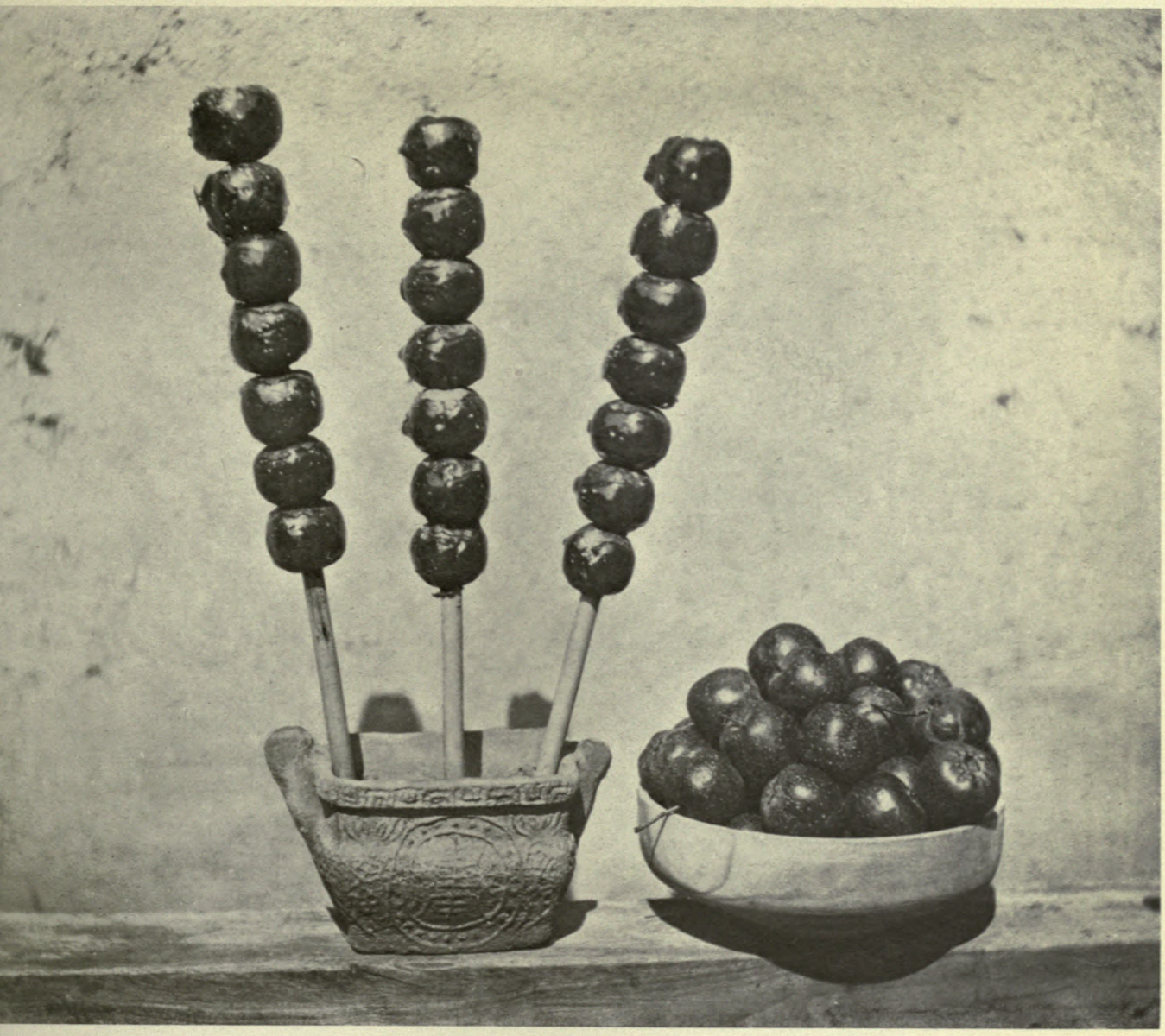
Dolichos hosei Craib. (Fabaceae.) 39335. Seeds of the Sarawak bean from Kuala Lumpur, Malay States. Presented by the Director, Department of Agriculture. "I have found a small creeping bean of the Vigna family which is indigenous to Sarawak, but as yet I have been unable to ascertain its name, and I think it is just possible that it has never been reported from Sarawak. This bean appears to fulfil all that is required (low-growing leguminous plant which can be dug into the soil and reproduce itself in time to check the growth of weeds) and grows readily from cuttings, but seeds are very difficult to procure. The flower is yellow and the leaf a rich light green; the roots do not penetrate the ground more than one inch; the plant forms a thick level mass about six inches thick on the ground, and it will grow on almost any soil, but for preference a light soil, and in six months after planting should prevent all washing if planted three feet apart. I have been planting this bean with rubber for three years and have now 200 acres planted with it, and it has proved itself in every way a success." (Hose, in Agricultural Bulletin of the Federated Malay States.)

Gliricidia sepium (Jacq.) Kunth. (Fabaceae.) 39331. Seeds of the "Madre de cacao" from Manila. Presented by Mr. D. LeRoy Topping, Bureau of the Treasury. "I used it for a house decoration and had stalks of it fully ten feet long that were a mass of bloom, and everybody exclaimed 'quite like a bit of Japan.' The plant is inclined to sprawl and if wanted purely for ornamental purposes it would be well to prune it." (Topping.)

Kokia drynarioides (Seem.) Lewton. (Malvaceae.) 39354. Seeds from Mahana, Molokai, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. This very

interesting relative of the cottons was supposed to be extinct, a single tree only remaining on the Molokai ranch where it occurred, but during the summer this tree supposed to be dead, revived and a single branch put forth leaves and flowers and produced a few seeds. These seeds were procured for this Office by Mr. Rock, and will be propagated for distribution for comparison with *Kokia Rockii*, already widely distributed to botanic gardens.

Lycopersicon esculentum Miller. (Solanaceae.) 39362. Seeds of a wild tomato from Funchal, Madeira. Presented by Mr. Charles H. Gable, Director, Junta Agricola. "The little wild tomato, *Lycopersicon vulgare cerasiforme* which is found in Madeira is considered by Lowe (Manual Flora of Madeira) as being the original stock from which our cultivated varieties have been derived. The same author states that besides 'growing spontaneously everywhere below 2000 feet above Funchal and other towns and villages in Madeira, it is completely naturalized on the central rocky crest of the North Deserta.' The North Deserta is an almost barren, uninhabitated island which lies about thirty miles north from Madeira. The selection which has taken place in the development of our cultivated varieties has not greatly changed the general appearance of the plant. The writer has not had the opportunity of making the careful botanical study necessary for the intelligent comparison of the characters presented by this wild tomato and our cultivated varieties, so there will be presented here only very brief observations of the conditions in which the plants grow. One of these plants was transplanted to a favorable part of the garden where the ground was rich, and had plenty of moisture. It made a tremendous growth, and at the end of three months, the plant was five feet in diameter and three and one-half feet high. Unfortunately the plant was destroyed, so that it was impossible to complete the record. Another plant was found where it could not have had a drop of water for at least three months. It probably had started to grow during the last few rains of the spring, but had completed its growth during the heat and drought of the summer. The particular spot where it grew was the hottest of the hottest part of the island. When it was found, the vine was apparently entirely dead, and lying flat on the ground; the leaves had dried up and dropped off, but the fruits every one of which was ripe, were clinging to the vine. It also seemed very strange to find that the fruits were all plump and firm, over three hundred of them on this one vine. The fruits are so very acid that they can be used for little else besides soups, and the natives do not use them a great deal even for that. Their keeping quality, however, may prove a desir-



CRATAEGUS PINNATIFIDA.

"Three sticks with Chinese Haw fruits, over which molten sugar has been poured and a wooden bowl with haw fruits." Little horticultural study seems to have been given to the question of edible fruited hawthorns although we have several large fruited forms adapted to cultivation over a wide range of territory. (Fairchild). Photo No. 981, by F. N. Meyer, Tai an fu, Shantung, China, March 20, 1914.

Chinese Haw Trees.

"A few grafted specimens of a large fruited variety of Chinese Haw tree (*Crataegus pinnatifida*) near a farmer's house showing off its typical, low-branching habit." The fact that the culture of this fruit is increasing in China and that the fruits themselves make a most excellent jelly warrant experimenters in giving it a preliminary trial in this country. (Fairchild.) Photo No. 983, by F. N. Meyer, near Tai an fu, Shantung, China March 29, 1914.

able characteristic in crossing with some of the highly developed varieties with the object of obtaining a good shipping tomato of pleasing flavor." (Gable.)

Manihot spp. (Euphorbiaceae.) 39337-340. Seeds of maniçoba rubber trees from Bahia, Brazil. Presented by Dr. V. A. Argollo Ferrao. "The good name that Jequiè rubber had was on account of being prepared in sheets and pure, because the *Manihot dichotoma* is tapped on the bark in 'porangos (tins)' like Hevea, so such rubber is clean from impurities and is easily prepared in thin sheets of nice appearance. *Manihot heptaphylla* (Rio Sao Francisco zone) and *Manihot piauhyensis* (State of Piauhy) being tapped near the roots, if not tapped carefully, give rubber that have large proportions of sand and clay. As to quality the Jequiè is the worst, for it has resins and less elasticity. Growers who planted *M. dichotoma* succeeded badly because the growth of the trees is extraordinarily variable. Seedlings from the same tree show an extraordinary variability of leaves and growth. *M. dichotoma* requires at least six years as a rule before tapping. The best variety for plantations is *M. piauhyensis*, for it gives the best rubber, and can be tapped at three years (even at two under good conditions.) With low prices of maniçoba rubber, maniçoba can only give profits if labor is very cheap, not exceeding thirty cents per day. Maniçobas will not stand frosts (I have seen some severely injured in Sao Paulo by slight frosts in coffee districts.) Maniçoba requires a rainy season in summer. The *M. heptaphylla* and *M. dichotoma* are found in parts of the state of Bahia on the other side of the chain of mountains that divide the state in two climates. Between mountains and sea, rains occur during winter, and on the other side, from mountains to Rio Sao Francisco rainfall is in summer. Maniçoba grows in the second zone if planted but does not give much rubber nor good quality, as Villa Nova plantations show, although trees have the best appearance. (Villa Nova is on the mountain that divides the climatic zones of the states. In mountains you have rains in summer and 'neblines' (fog rain) in winter). In the maniçoba districts there are heavy rains during summer for four to six months, such rains may last for ten days, day and night. There are no rains during the dry season and from time to time, about once in ten years, the summer rains fall. In our state people who have maniçoba forest or plantations, are investing in cotton because the low price of rubber does not give enough profits to pay for tapping trees. Maniçoba will not stand stagnant water." (Argollo Ferrao.)

Onobrychis vulgaris Hill. (Fabaceae.) 39343. Seed of sainfoin from Paris. Purchased from Vilmorin-Andrieux and

company. One of nine forage crops little known in this country introduced for the work of the Office of Forage Crop Investigations. Among the others are the serradella, gorse or whin, yellow trefoil, various lupines, Scotch broom and giant spurry.

Passiflora ligularis Juss. (Passifloraceae.) 39360. Seeds of a granadilla from Bogota, Colombia. Presented by Dr. Ancizar, secretary of the Colombian Legation, through Mr. W. E. Safford. "An egg-shaped fruit with parchment-like shell filled with an abundance of sweet juice and many small seeds. Used in tropical America for making sherbets and ices alone or with the addition of lemon juice or spices. Of easy culture in all the warm localities, growing in the form of a vine from trellises and arbors, and desirable not only for its fruit but its beautiful flowers." (Safford.)

Tibouchina stenocarpa (DC.) Cogn. (Melastomaceae.) 39333. Seeds from Lavras, Minas Geraes, Brazil. Presented by Mr. Benjamin H. Hunnicutt, Director, Escola Agricola de Lavras. "Seeds of a wild shrub, commonly called 'Quaresma' or 'Lent,' as it blooms at Lent. It has a beautiful purple flower and the blooming season covers a number of months. It grows well on the poorest, driest grounds we have and blooms during the dry season. I think it has been cultivated in some gardens in Brazil, although I have never seen it. Ornamental only."

NOTES FROM CORRESPONDENTS ABROAD.

China. Tientsin. Dr. Yamei Kin writes November 18 in reply for information concerning peach blossoms, "I had just sent off a letter with some seeds when yours with photos of the peach flowers and inquiries came to hand.

"I will do as you request and take a special look at the orchards of the vicinity when they come into bloom this spring, but I thought it might interest you to know the answers to my questions from the people of my staff and country patients that happen to be on the premises.

"Without saying anything about what your inquiries were (whether the blossoms were typically large and clear pure white, or small and creamy white) I merely took the photos and asked them if they were like the peach flowers that they were accustomed to see in their fruit orchards. Unanimously without the slightest hesitation they pointed to the photo with the intermediate and small flowers, and generally designated voluntarily the middle branch (that with small, relatively inconspicuous flowers) as being the most like, and also remarked that the color was white as a rule though pink ones were not unknown. A few people said

that the right hand branch (with intermediate sized flowers) was more like an apricot than a peach bloom. The photo of the large conspicuous white-flowered type some did not recognize as being a peach flower, though others said that kind was never cultivated in the orchards but only for ornament, as it never bore anything but scrubby little fruit, bitter and leathery. Now my own recollection, though I do not recollect ever having been through a peach orchard here in North China during flowering season, only passing them in the railway train, is that the orchards show white predominatingly, and I distinctly recollect trying to get some pink double flowering peach potted plants last spring and was rather struck with the fact that I could not find anything except clear pure white, as you say, not even the cerise colored ones which I know are abundant in south and west China and in Japan. Yet the ordinary name for pink is peach flower color, and notwithstanding the love of Chinese for color, it is used sparingly, in fact, owing to its being associated with the peach blossom, seems to have an unsavory significance, as I found when I came home one day with a pink satin brocade gown that I had just purchased. My people held up their hands in horror, and exclaimed it was a mercy that I did not intend to wear that here, it would only do for outside countries that did not know about peach flowers, which remarks led me to leave it in America when I came back, though it was a very lovely delicate color and one of my prettiest gowns.

"The reason for this prejudice is owing to its symbolism. Just as the violet is considered in western lands to be the symbol of modest worth, so the plum is that of feminine virtue in China and the peach flower the opposite. Not even the beauty of its color, whether delicate pink or deep cerise, redeems it from this fatal significance. In order that there may be no possible opportunity for a 'peach flower heart' to spring up unawares in some girl of respectable family, it is not considered wise to plant a peach of any kind near the bed room windows of the court yards inhabited by the women, yet peach wands are supposed to be especially useful to beat off all evil spirits, only they must be plucked during a solar eclipse and a hole bored through one end for hanging up by, during a lunar eclipse, which perhaps accounts for their fewness, as during those times in the old days the people were generally busily occupied in beating gongs and firing off crackers to drive away the heavenly dogs which were supposed to be devouring those luminaries, and no one had time to think of making peach wands! The lucky possessor of an efficacious peach wand is supposed to be able to sleep at night with it under his pillow in full confidence that no evil spirits can harm him!

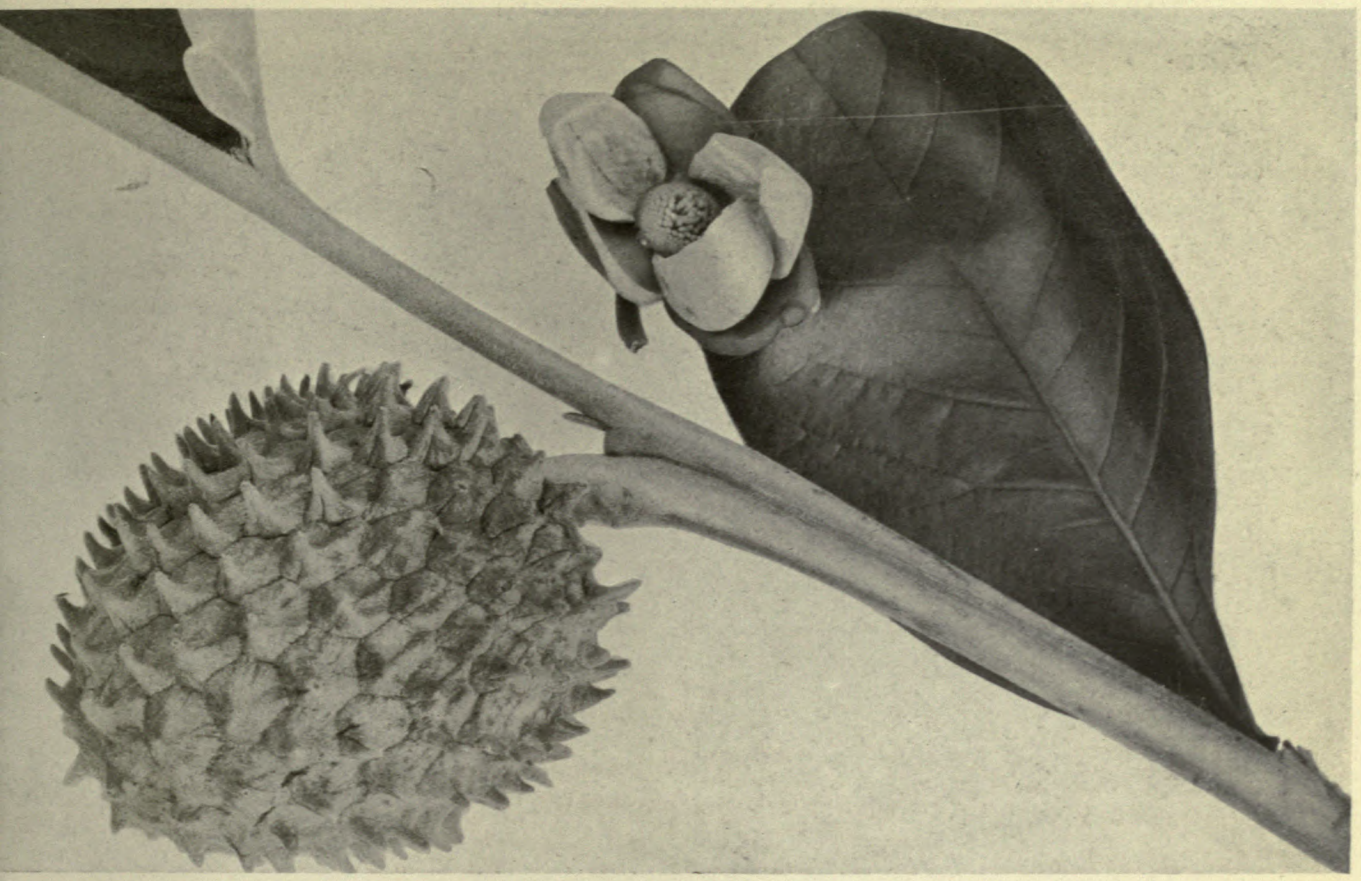
"Taoism from early days has taken the peach as its particular fruit, signifying longevity, much as the apples of Hesperides were symbolic in the Grecian mythology.

"Furthermore peach stones are often made into rosaries which are considered specially fine. There is a collection of tales by one Cornaby to be found in almost every library called 'A String of Peach Stones.' And a host of legends cluster around the tale of Sun, the stone monkey, eating the peaches of immortality stolen from the gardens of the genii, whereby he attains immortality. This theme is seen elaborated in many scenes, that decorate pottery, textiles, and congratulatory scrolls.

"I wish that I were not tied down so much by tedious detail in the medical work, as there is a most interesting book that needs to be translated telling much of the folk lore of the peach interwoven with the plot, which is supposed to be the journey of Hsien tsang to bring back the sacred sutras of Buddha from India. It is said that this is an actual historic occurrence, but this tale is evidently semi-religious and allegorical, as well, combining in itself the characteristics of Bunyan's Pilgrim's Progress, Hans Christian Andersen, and the Arabian Nights, if you can imagine such a mixture, yet giving graphic pictures of Chinese life in various phases that are as true as when the book was written.

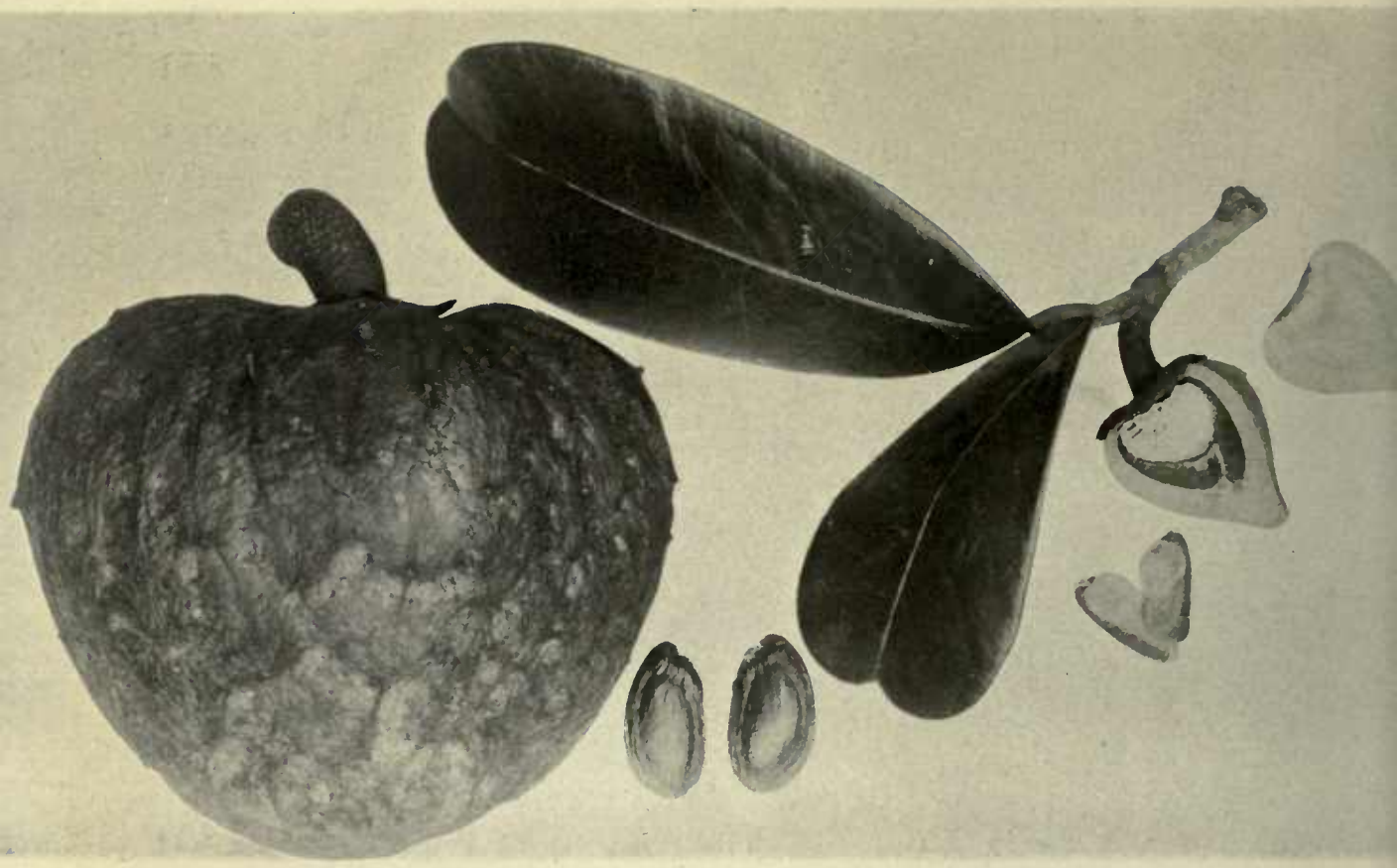
"However this is wandering far from the subject in hand, of the true type of the peaches of the north China group. I will make further inquiries of gardeners and orchardists as I have opportunity, but I think you may feel pretty sure, the fruit-bearing kinds are the white-flowered small kinds, and the large pure white are only for ornament; often they are grown so large and full as to be like small roses. But why here in the north the white should predominate I am puzzled, unless the symbolism has something to do with it, for I recollect that both in west and south China and Japan the large double cerise colored peach blooms were quite common. In Japan the single pink large flowered variety was sold quite as freely as the white, but I do not have any clear recollection of this light pink being doubled in any profusion, and certainly since my residence here in north China I have not seen any double light pink peach flowers, though the generally accepted idea is that the peach flower is pink. Maybe it does not lend itself so readily to the doubling process as the white or cerise varieties, but there is very evidently a prejudice against the pink colored ones, nearly all the distinctly pink flowers being apricots, against which, strange to say, there is no prejudice.

"One of the most charming legends of peach flower lore is that of the 'Peach Blossom Fountain,' an allegory



AN ANNONACEOUS FRUIT FROM THE HIGHLANDS OF BRAZIL.

On the campos or open plains of the high plateau which extends throughout a large section of central eastern Brazil there are numerous species of annonaceous fruits, many of them of dwarf growth. The name araticum, sometimes with the addition of a qualifying word such as *araticum do brejo*, *araticum do campo*, etc., is applied to nearly all of them. The one here shown *Annona dioica*, was found near Lavras at an altitude of about 800 meters. It grows to a height of about four or five feet, with numerous thick, woody stems arising from the ground. Its fruit here shown in an immature stage, eventually becomes about three inches in diameter. The flesh is edible, though not considered by the natives as good as that of one or two other species which occur in the same region. To breeders of tropical and subtropical fruits the Annonaceae is an extremely interesting class of plants, and presents attractive economic possibilities. Photo No. D-1366 by Dorsett, Shamel and Popenoe in Bahia, Brazil, March 12, 1914.



A NEW ANNONACEOUS FRUIT FROM BRAZIL.

This interesting species, identified by Mr. W. E. Safford as *Annona salzmanni*, is known in the vicinity of Bahia, Brazil, where it is found, as *araticum*, a name which is applied indiscriminately to a number of annonaceous fruits. It was described and named from specimens of foliage and flowers collected some years ago, but the fruit had never been seen by botanists and remained unknown until it was found near a small lagoon on the farm of Col. Demetrio Luiz de Souza. at Bahia, by Messrs. Dorsett, Shamel and Popenoe in 1913. Good specimens are frequently larger in size than the one shown in the photograph, and when ripe are light creamy yellow in color. The flesh is milky white, very sweet in flavor, containing numerous seeds. It may prove of value in breeding annonaceous fruits for tropical and subtropical regions, an important field open to plant breeders which has as yet been scarcely touched. Photo No. 15433 by Dorsett and Popenoe at Lavras, Minas, Brazil Jan. 12, 1914.

written by T'ao Yuan Ming between A. D. 365-427, describing how a fisherman got lost one day and penetrating up a river finds himself in a creek bordered with many peach trees full of bloom, at the end of which he comes upon a small mountain in which is a cave which he traverses and enters on a new country where there is every sign of prosperity, every one is courteous to each other, kindliness and contentment prevail, but they wear the garb of the times of the First Emporer some five centuries previous and have been lost to the rest of the country ever since. The fisherman returns after a sojourn with them, and tells his fellow villagers of this wonderful country and stirs up so much interest that finally the governor of the province joins in the search for this wonderful country, but it is all of no avail and at last the fisherman realizes that he will never more see the peach blossom days of his youth with its rosy dreams and ideals that come but once in a lifetime."

Palestine. Zicron Jacob. Mr. Aaron Aaronsohn writes March 2, 1915: "In reply to your letter of Jan. 9, asking for seeds and cuttings of *Prunus ursina* I am sorry to say that at this time it is entirely impossible to think of going up to the Mount Hermon for botanical and agricultural purposes. We are doing practically no work worth mentioning owing to circumstances entirely independent of our good will. Corresponding is practically impossible now and you will excuse us for our long silence."

Italy. Rome. Dr. Gustav Eisen writes March 12, 1915: "I expect to leave here on the steamer Stampalia March 24th. I have prepared a 'Notes on Italian Fruits', with principal references to those in the Roman markets, etc., which I will send you from New York, expecting to finish copying it on the steamer. There are dozens of varieties which I should like to have sent the Department, such as the large Syracusa blood orange, Cerina apple, Posele and Crisomele di Somma, etc. The Limoncella apple is the same as the one you have seen. There are however two varieties, exactly alike in quality, but different in size and time of maturity. One is the Mela Limoncella proper and the other Rosmarina di Napoli. The latter is a trifle larger and does not last quite so long into the winter. That is as far as I can learn at present. I have seen both and that is what I have been told. But as you know, the names of fruits in Italy are somewhat uncertain and those who know are few and far between. So far I have not come across anyone in Rome who could give me the information wanted, and all the literature I have consulted

differs to an alarming extent. The Limoncella proper seems to prefer a very hot climate. The Rosmarina di Napoli hardly extends to Sicily, while the Limoncella is entirely at home in Sicily, and is there one of their very best apples. The name when you speak of the tree is Melo Limoncello, but when you speak of the fruit it is Mela Limoncella, plural, Melo Limoncello. The name of course is derived from the resemblance to a lemon, in size, shape and color. The Limoncella is truncate at the apex. These apples are now abundant in the market and sell at three for four soldi, retail. An even better apple is the Cerina, twice the size, pale waxy yellow, with reddish brown cheek. Crisp, juicy, sweet and subacid. Really one of the best apples I have tasted. It is remarkable on account of its sweetness, like sugar indeed, at the same time subacid. This also is now in the market, and if I can come across some in Naples I will bring you a sample, though the quality at this time is not as good as it was in February, when it was simply splendid. It upset my former opinion as regards the quality of the larger kinds of apples grown in the south. I am sorry that the Harrar fig cuttings did not arrive in prime shape. But they looked sickly when I got them and I could not get any more then. The fig is quite remarkable, sweeter than any fig I have ever tasted, and it should be fine for seedlings. It is not above medium in size. It certainly is not a variety of *Ficus carica* but more likely *F. pseudocarica*. It looks very curious. I saw it first some ten years ago in Sicily. But my friend the proprietor has since died. He was Count Grimaldi, near Syracusa. I wonder if his numerous hybrid grapes, some most remarkable, were ever introduced into the United States?"

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections and Office Herbarium.
S. C. Stuntz, Botanical Assistant, in charge of Explorer's Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow) Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Coroata, Maranhao, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 103. November 1914.

Genera Represented in This Number.

Ampelopsis	39434	Passiflora	39383
Amygdalus	39428	Prinsepia	39432
Annona	39388	Prunus	39429-430
	39456		39436-439
Brassica	39467	Rhamnus	39433
Gynopogon	39463	Spathodea	39415
Holcus	39440-442	Xanthoceras	39431

Plates:

Chinese wild peach (Amygdalus davidiana) on Pekin city wall.
Jujube (Ziziphus jujuba) plantations on loess.
Diospyros lotus on which is grafted D. kaki.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Ampelopsis aconitifolia dissecta (Carr.) Koehne. (Vitaceae.) 39434. Seeds from Ping yang fu, Shansi, China. "A variety of Ampelopsis, with finely-cut foliage, of light green hue and bearing dull-yellow berries. Very ornamental when covering a wall or trained over some lattice work. Of value as a porch, arbor and pergola-vine, especially in semi-arid climates." (Meyer's introduction.)

Amygdalus sp. (Amygdalaceae.) 39428. Seeds of a wild peach from Sianfu, Shensi, China. "Stones of the real wild peach, growing in the mountains, one day's journey south of Sianfu. The fruits are small, hard and sourish, but there is considerable variation in them as regards size and taste. They are apparently all freestones and while some have red flesh near the stone, others are white throughout. The Chinese eat these fruits out of hand, but to the white races they do not appeal as such, although they might be utilized when preserved as they possess the real peach flavor. Local name Ying tao, meaning 'Cherry peach.'" (Meyer's introduction.)

Annona glabra L. (Annonaceae.) 39388. Seeds of a pond-apple from San Juan Bautista, Tabasco, Mexico. Presented by Mr. G. Itié, Director, Agricultural Experiment Station. "*Corcho*. Grows in abundance on the margins of the lakes around San Juan Bautista. The pulp of the fruit, of an orange color, is very fragrant. Eaten at times by the inhabitants. Sometimes used as a stock in grafting other Annonas." (Itié.)

Brassica pekinensis (Lour.) Skeels. (Brassicaceae.) 39467. Seeds of a Chinese cabbage from China. Presented by Miss Paula Ritter, Chicago. One of a collection of about twenty Chinese vegetables including turnips, cabbage, lettuce, cucumber, egg plant and beets.

Gynopogon ilicifolius (Muell.) K. Schuman. (Apocynaceae.) 39463. Seeds from Wellington Point, near Brisbane, Queensland, Australia. Presented by Mr. James Pink. "A shrub growing about six feet high, having white flowers and producing a profusion of berries of a bright orange scarlet. It should make a valuable ornamental plant for decorative purposes." (Pink.)

Holcus sorghum L. (Poaceae.) 39440-442. Heads of kaoliangs from Shensi and Shansi, China. One form especially interesting (No. 39440) grown on reclaimed mud flats along the Yellow River, near Ta ching kuan, Shensi, where the fields are often inundated for several weeks at a time. These plants grow extraordinarily tall, specimens 15 feet in height not being rare. (Meyer's introductions.)

Passifloris maliformis L. (Passifloraceae.) 39383. Seeds of a curubá from Bogota, Colombia. Presented by Mr. Henry Coronado, Columbian Bureau of Information, Washington, D. C., through Mr. W. E. Safford. "Fruit depressed spheroid, hard shelled, suitable for shipping. Pulp of fine flavor used for making sherbets." (Safford.)

Prinsepia sinensis (Oliver) Schneider. (Amygdalaceae.) 39432. Seeds from near Fu cheng, Shansi, China. "A spiny shrub, having many long branches, growing from 3 to 5 feet in height and of spreading habits. Foliage lanceolate and serrate, resembling that of a Rhamnus. Flowering early in May with pale-rosy flowers, produced in great masses. In July the fruits ripen which are of a dark-red color and resemble small cherries in general appearance. They are quite juicy but sour; however they vary a good deal as regards size, degree of juiciness and acidity, some being edible out of hand, while others are very acrid. By selection, strains could be obtained no doubt, which could be cultivated as garden fruits. The shrubs love a well-drained situation and thrive quite well even on rocky debris. Of value as an ornamental spring-flowering bush and as a prospective fruiting shrub, especially for the dryer parts of the United States, where the winters are not too severe. Local Chinese name *Tzu yu*, meaning 'spiny elm.'" (Meyer's introduction.)

Prunus armeniaca L. (Amygdalaceae.) 39429-430. Seeds of apricots from Pekin, China. Two forms, one "a large apricot of soft yellow color and of mango shape, which is a very unusual form among apricots, said to come from the vicinity of Paotingfu, Chili," the other "with fruits as large as small apples, of whitish-yellow color with some blush on one side, of fresh and sweet taste, said to come from the same vicinity" (Meyer's introductions.)

Prunus armeniaca L. (Amygdalaceae.) 39439. Seeds of wild apricots, from near Lien ma, Shansi, China. "Wild apricots grow in great profusion here and there on the mountain sides at elevations between 3000 and 5000 feet above sea. Trees of medium size, fruits generally small and sourish, but often most beautifully colored. The natives collect these fruits for their kernels, which are pickled in brine after the skin has been removed and which are eaten as appetizers with 'snacks' or before meals. They are also used in high-class confectionery, like almonds, which the Chinese do not have, strange to say. Chinese name *Shan hsing*, meaning 'mountain apricot.' For trial in such northern sections as Colorado, Utah, Wyoming, etc." (Meyer's introduction.)

Prunus simonii Carr. (Amygdalaceae.) 39437-438. Seeds of plums from Pao tien, Shansi, and Ho dien, Honan, China. Large varieties of green plums, one having a small stone, the other with somewhat hard flesh, and apparently a good shipper. (Meyer's introductions.)

Prunus sp. (Amygdalaceae.) 39436. Seeds of a dwarf plum from Yun cheng, Shansi, China. "A variety of wild Chinese dwarf plum, with fruits as large as good sized cherries, but of sour flavor. Said to grow here and there in the mountains near Yun cheng. Chinese name *Soo li*, meaning 'sour plum.'" (Meyer's introduction.)

Rhamnus sp. (Rhamnaceae.) 39433. Seed from Ku lo, Shansi, China. "A tall, shrubby Rhamnus, often growing into a small tree. Of spreading habit, leaves slender, lanceolate and serrate, looking not unlike slender *davidiana* peach leaves. This shrub is apparently rare; it is found here and there in loess cliffs and on old grave mounds. It seems to be able to withstand a good deal of alkali. Of value as a park shrub and possibly as a hedge plant, especially for the drier sections of the United States. The purplish-black berries possess a sickening sweet taste and are apparently not eaten by the Chinese." (Meyer's introduction.)

Spathodea campanulata Beauv. (Bignoniaceae.) 39415. Seeds from Peradeniya, Ceylon. Presented by Mr. H. F. Macmillan, Superintendent Royal Botanic Gardens. "This seems to be the only species of Spathodea generally known in the East. The tree flowers profusely at Peradeniya almost throughout the year, except in the dry season, but seldom or never bears fruit here. It produced, however, fruit and seeds in our former garden at Anuradhapura, now abandoned, where the climate is much drier than at Peradeniya, the rainfall being limited to three months of the year." (Macmillan.) Seedlings grown from seed collected by Dr. B. T. Galloway in Java are now twenty feet tall in the Miami Gardens, Florida. (Fairchild.)

Xanthoceras sorbifolia Bunge. (Sapindaceae.) 39431. Seed from Tchao yu, Shansi, China. "A shrub, occasionally growing into a small sized tree, found in loess cliffs. The shiny pinnate foliage reminds one of an ash, but the drooping racemes of white flowers, with yellow stamens, produced in great masses in early summer, give the shrub quite a distinct appearance. The Chinese eat the kernels of the fruits and call the plant *Mu kua hua*, meaning 'quince flower,' on account of the large fruits resembling those of the Japan quince (*Choenomeles japonica*). This

"A Chinese wild peach, (*Amygdalus davidiana*) growing on the Pekin city wall, showing the real xerophytic nature of this remarkable stone fruit. The seed was probably deposited there by one of the crows which carry about many things in China". This wild peach has proven in China to be a remarkably valuable stock for stone fruits. In America it is being tested extensively both because of its drought resistance and resistance to cold. Photo No. 989, by F. N. Meyer, Peking, China, May 8, 1914.

Winter view through a Chinese Jujube plantation located on one of the loess terraces near Lingpau in the Honan province of China. In the background is a Buddhist temple surrounded by old arbor vitae trees. The Jujube (*Zizyphus jujuba*) is grown for its fruits which when preserved resemble dates. It has proven hardy where the temperature goes to 22° F. Photo No. A 38, by F. N. Meyer, Lingpau, Honan, China.

shrub, closely related to the horse-chestnut, is decidedly ornamental and of special value as a garden shrub for those semi-arid sections of the United States where the winters are not too severe." (Meyer's introduction.)

NOTES FROM CORRESPONDENTS ABROAD.

Palestine. Jerusalem. Mr. John D. Whiting writes January 19, "I am gratified to learn that the jellies and preserves sent you were found not only delicious, but that the hawthorn has aroused special interest. We have three species of hawthorn trees that grow here. The variety used for this jelly is the *Crataegus azarolus* L. The fruit, which is about three-fourths of an inch in diameter, is bright yellow when ripe, and eaten raw by the natives who like the acidity of the juice. They do not ripen till mid-summer, which would be the earliest they could be sent. To make the jelly the fruit is covered with water so that in the kettle there is clear water above the fruit a little less than one-third of the fruit below. This is boiled till the hawthorn is thoroughly cooked. The juice is strained off and an equal quantity, by measure, of granulated sugar is added and boiled until properly jellied. For large quantities, as we make it, about an hour's boiling is required. Small amounts take less time."

Algeria. Algiers. Dr. L. Trabut writes January 12, 1915, "I have received in a collection the Moroccan varieties of orange. I have one orange from Tetuan, one from Tanger, and two from eastern Morocco. But nothing so very remarkable. These oranges have been recommended too highly, inasmuch as those, by whom the oranges have been tasted, have found them during the hot seasons in the mountain gorges and at that moment all oranges appear excellent. I have not thought I needed to send you cuttings because I thought that you would not have use for any varieties much inferior to those which you have. The Algerian Navel shows itself to be very interesting. It is a seedling. The fruit is large, depressed, very juicy and with a pronounced navel. It is at present the only interesting local type of this group. You have had it already. If you wish it I will send you a new shipment. The Algerian navel is two months later than the Washington navel. It is superior having a more juicy, more melting pulp."

China. Pekin. Mr. D. F. Higgins writes, March 26, 1915: "I have had the pleasure of several interesting conversations with Mr. Meyer. He is certainly a hard worker. I was disappointed to learn from him of his difficulties

in Kansu. But I was pleased to learn that he seems to have at last found a really wild type of North China peach. This seems to settle the matter of the origin of *P. persica*. His other discoveries are almost of equal interest, notably of the hardy species of Citrus, and of the giant hazel tree. I understand that Mr. Meyer may be going to the States this June, but that he may visit Siao wu Tai Shan before he goes. I myself am planning to revisit that interesting locality if possible this spring. Under separate cover I am sending Korean 'da-reh' seeds and photographs. The seeds are in rather small fruits on account of the lateness of the season when they were gathered. They were secured through the kindness of Mr. P. C. Kang, of Hol Kol, Korea, a Korean friend of mine. It is characteristic of the spirit of the Koreans, that the coolies, which he sent had to go about eight miles, over a pass which required an ascent and descent of more than two thousand feet and then received but twenty sen (a little less than ten cents U. S. currency) apiece for their day's work because they could not secure first class specimens of the 'da reh' fruit. I tell you this little fact because of the spirit against the Koreans which has been bred for years in the United States through the colored press reports from the East."

Extensive plantation of the "Ta hong tsao" or "large red jujube", (*Ziziphus jujuba*). The jujube thrives well on these loess table-lands of Honan province and suggests its culture on our own soils of similar wind-formed character which occur in Iowa, Nebraska, Missouri and other of the Middle Western states. Photo No. A 39, by F. N. Meyer, Lingpau, Honan, China, Dec. 24, 1914.

"Another Ghoorma persimmon, *Diospyros lotus*, on which a kaki variety has been grafted, growing at the very edge of a loess plantation." In China the Oriental persimmon or kaki (*Diospyros kaki*) is generally grafted upon another species of persimmon called the Ghoorma (*Diospyros lotus*). The illustration shows one of these grafted trees growing on the very edge of one of the peculiar perpendicular walls of a ravine through the loess soil occurring commonly in the Honan Province. This stock should be tested on the loess soils of the United States. Photo No. A 32, by F. N. Meyer, near Lingpau, Honan, China, Dec. 23, 1913.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

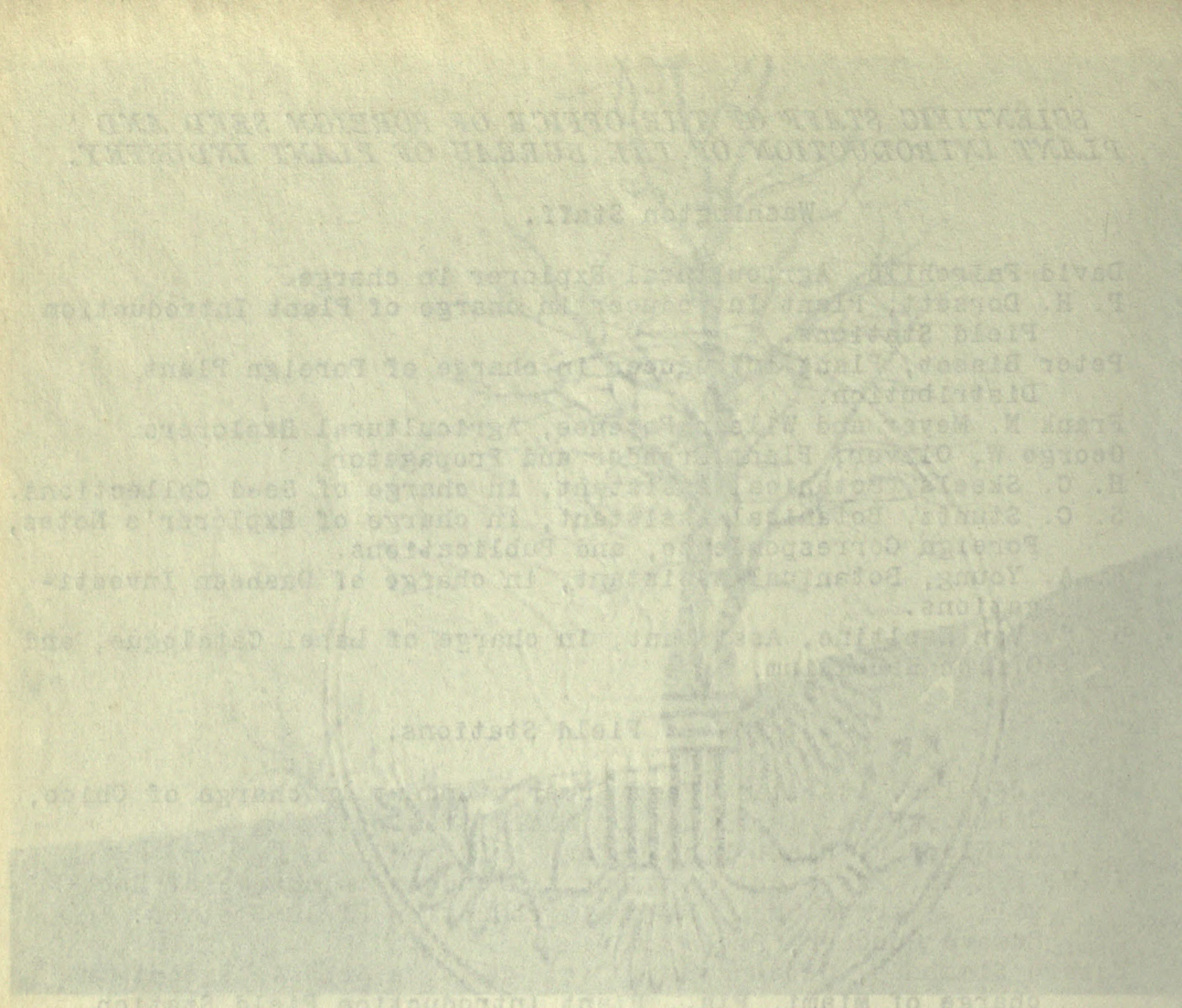
David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorer's Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville (Yarrow) Md., Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.



PROPERTY OF DIVISION
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 104. December 1914.

Genera Represented in This Number.

Adenanthera	39542	Laurocerasus	39584
Ampelopsis	39569	Mangifera	39485
Annona	39567	Myricaria	39630
Anthocephalus	39637	Phaseolus	39589
Berberis	39574	Phlogacanthus	39653
Boehmeria	39638	Pyrus	39538-541
Citrus	39579		39547-548
	39581	Randia	39655
Holcus	39594	Spondias	39563
Hypericum	39644		

Plates:

Diospyros kaki. Tree grafted on *D. lotus*. Dried persimmons.
Annona squamosa. Sugar-apples in a basket.
Catinga lands of interior Brazil.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Adenanthera pavonina L. (Mimosaceae.) 39542. Seeds from Little River, Florida. Presented by Mr. Charles T. Simpson. "A large tree from tropical Asia with dark green bipinnate leaves and spiral rods of lenticular, brilliant red beans. These are used for food by the natives of India and are strung into beautiful necklaces. The flowers are brownish, in long spikes. The tree is a rapid grower and is quite ornamental." (Simpson.)

Ampelopsis megalophylla Diels & Gilg. (Vitaceae.) 39569. Cuttings from the Arnold Arboretum, Jamaica Plain, Mass. Presented by Dr. C. S. Sargent, Director. "A glabrous vine, climbing to thirty feet; leaves long-petioled, 6-15 inches or sometimes longer, the larger ones bipinnate; the lower pinnae with 3-9 leaflets, the lowest pair often three-leaved; leaflets petioled, ovate or ovate-oblong, 2-5 inches long, rounded or subcordate at the base, membranous, remotely serrate, pale or glaucescent beneath, veins nearly straight, ending in the teeth; fruit bluish black, in loose cymes." (Rehder in Bailey, Standard Cyclopedia of Horticulture.)

Annona diversifolia Safford. (Annonaceae.) 39567. Seeds of the ilama from San Salvador, Central America. Presented by Mr. Ralph D. Cornell, Claremont, California, through Mr. Wilson Popenoe. "According to Mr. W. E. Safford, this interesting and valuable Annona is called *ilama* at Colima, Tlatlaya, and Acapulco in southern Mexico. He describes the fruit as large, fleshy and aromatic, with the juicy pulp frequently pink or rose-tinted. It is shaped like a pineapple cheese, and is usually covered with large stout protuberances, though sometimes they are lacking in fruits of the same tree. Undoubtedly this is one of the best of the Annonas, though rare and little known. It should be given a careful trial in southern Florida and southern California." (Popenoe.)

Anthocephalus cadamba (Roxb.) Miquel. (Rubiaceae.) 39637. Seeds from Darjeeling, India. Presented by Mr.G. H. Cave, Lloyd Botanic Garden. "A large deciduous tree wild in northern and eastern Bengal, Pegu and the western coast, cultivated in northern India. During the first two or three years it grows very fast, about 10 feet a year, while the girth increases at the rate of one inch a month. After 10 to 12 years the growth becomes very slow. The fruit is eaten and the foliage is sometimes used as fodder for cattle. The wood is white with a yellowish tinge, soft and evenly grained and much used for building purposes. This species is cultivated for ornamental purposes and for the grateful shade its large coarse foliage affords." (Watt, Dictionary Economic Products of India.)

Berberis aggregata Schneider. (Berberidaceae.) 39574. Plants of a barberry from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "This is one of Wilson's recent introductions from China, and was shown (at a Royal Horticultural Society Show) as a richly-berried, open-spreading bush about 18 inches high. The leaves, dull green above and grey-green below, are in axillary rosettes of about nine. They vary from ovate and entire to oblanceolate, with a few teeth or spiny hairs on the upper half, and are generally about one-half by one-fourth inch. The berries are small, nearly globular, and borne in dense close-seated clusters in one of which we counted as many as 21 berries, though they are more generally only half that number. They are a very charming creamy green color, suffused with coral, and reminding one of those of *B. wilsonae*." (Gardener's Chronicle, Sept. 27, 1913.)

Boehmeria rugulosa Weddell. (Urticaceae.) 39638. Seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Lloyd Botanic Garden. "A small tree with greyish brown branches met with in Garhwal, Kumaon, Nepal, Sikkim, and Bhutan. The wood is of a reddish color, moderately hard, evenly grained, durable and seasons well. It weighs about 41 pounds per cubic foot, and is very easily worked. It is used in the manufacture of bowls, milk pails, churns, cups and tobacco boxes." (Watt, Dictionary of Economic Products of India.)

Citrus grandis (L.) Osbeck. (Rutaceae.) 39579. Seeds of the 'panub-ban' from Lamao, Bataan, P. I. Presented by Mr. P. J. Wester, Horticulturist, Lamao Experiment Station. "An oblate fruit of the size of a large orange, smooth, of the same color as the pomelo, thinskinned, juicy and well-flavored. I have not seen the trees, but believe it to be a hybrid between the pomelo and the orange or mandarin." (Wester.)

Citrus sp. (Rutaceae.) 39581. Seeds of a lemon from Lamao, Bataan, P. I. Presented by Mr. P. J. Wester, Horticulturist, Lamao Experiment Station. "Seeds of a lemon that fruits already the second year from seed and is exceedingly prolific. The fruit is dry and seedy, but the variety might be useful in hybridization work for the production of very dwarf and precocious varieties." (Wester.)

Holcus sorghum L. (Poaceae.) 39594. Seed of a sorghum from Shiraz, Persia. Presented by Col. J. N. Merrill. Representative of a collection of sixteen numbers of grains from that region, including barleys, rice, wheats, and millet.

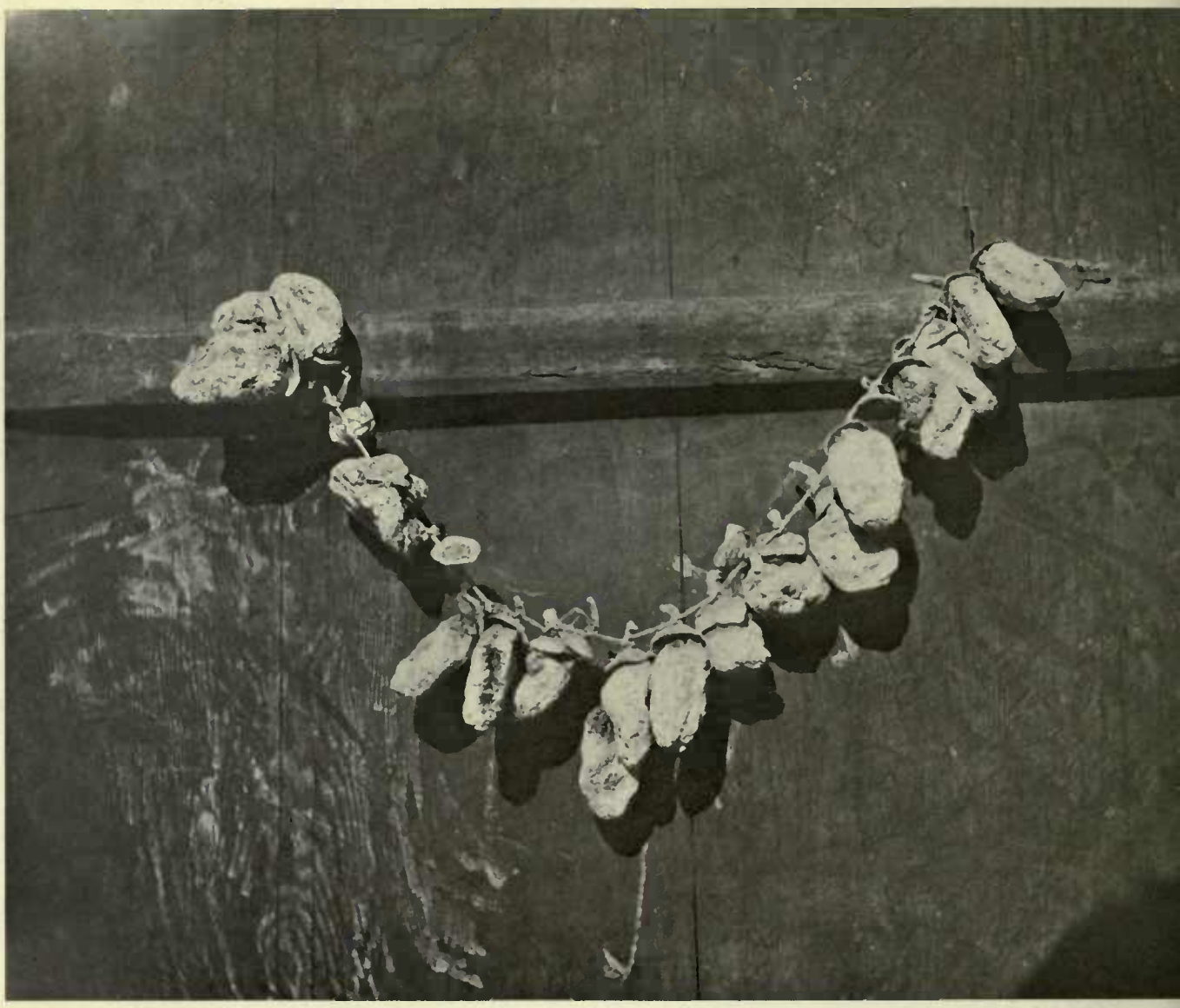
Hypericum patulum Thunberg. (Hypericaceae.) 39644. Seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Curator Lloyd Botanic Garden. "A dwarf shrub in England, but said to grow as much as six feet high in Japan and the Himalaya. Leaves one and one-half inches long, ovate, deep green above, glaucous beneath. Flowers two inches across, borne in a cyme at the end of the shoot; petals bright golden yellow, overlapping, roundish; sepals broadly ovate, one-third inch long. Stamens in five bundles. Introduced to Kew from Japan by Oldham in 1862; a native also of China and the Himalaya. It is not absolutely hardy in England (at Kew) and almost always has its stems cut back to the ground-level during the winter. These spring up again the following season from one to two feet high, and flower from July to October. After a few years the shoots are apt to become more and more weakly and it becomes necessary to renew the stock from cuttings. The only species with which it can be confounded are: *H. hookerianum*, from which it differs in the branchlets being two-edged, especially just beneath the flowers; *H. lysimachioides*, which has narrow, linear-lanceolate sepals; and *H. uralum*, with flowers half the size." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 639.)

Mangifera indica L. (Anacardiaceae.) 39485. Seeds of a mango from Ceylon. Presented by Mr. C. K. Moser, American Consul, Harbin, Manchuria. "A few months before I left Ceylon a Sinhalese friend sent me a few mangos which he called 'coconut mangos', which he said were from Jaffna and very rare. They were about as large as a coconut, and similar in shape, the skin and flesh a deep, rich yellow, except upon the cheeks, where burned a blush as glorious as any that ever dyed a peach. They were the most delicious fruits my wife and I ever tasted in all our lives. We never saw either in India or Ceylon any others like them, and when I wrote to Jaffna I was informed they did not grow there, but that they were evidently a rare variety which seldom fruited in Ceylon and then only in certain localities. Unfortunately I was too busy to investigate then and I have forgotten the name which Dr. Brown of Jaffna gave for them. It is certainly not commonly known in the middle East, and it certainly is a fruit for a king. It has neither fibrous flesh nor petroleum flavor; the fruits from which these seeds came were perfect." (Moser.)

Myricaria germanica Desv. (Tamaricaceae.) 39630. Seeds from Petrograd, Russia. Presented by the Director, Imperial Botanic Garden. "A deciduous shrub, six to eight feet high, glaucous grey, and of rather gaunt habit.

A Grafted Persimmon Tree in China.

The Japanese Persimmon or Kaki as grown in our southern states is generally a comparatively small tree, whereas the Chinese varieties of this fruit which Mr. Frank Meyer is sending in appear to form larger trees. The use of *Diospyros lotus* as a stock for these Chinese persimmons has been questioned by American nurserymen. The above photograph shows that in China at least it is a congenial stock for Chinese varieties. This particular variety is known as the "Kuo kei" (S.P.I. No. 37469). Photo No. A 29, by F. N. Meyer, near Lingpau, Honan, China, Dec. 23, 1913.



Dried Persimmons.

A small-fruited variety of *Diospyros kaki*, generally sold tied on strings. Its Chinese name is "Chen chien sze ping", meaning "pointed persimmon". The dried persimmon is an important food product in China and a good dried persimmon resembles somewhat a dried fig though it is not so sweet. The art of drying them has been investigated by Mr. Meyer and his account of the method was published on p. 750-751, No. 95 of this series, March 1914. Photo No. 976, by F. N. Meyer, Sianfu, Shensi, China, Jan. 30, 1914.

Branches erect, plume-like, clothed with flat, round-pointed, linear leaves, from one-sixteenth to three-sixteenths inch long. Flowers densely set in slender racemes three to eight inches long, which terminate the branchlets all over the top of the shrub; each flower is about one-fourth inch long, produced in the axil of a bract longer than itself; petals narrow, pink or pinkish white. Stamens ten; seeds feathery. Native of Europe, Himalaya, Afghanistan, etc.; cultivated in England since 1582. It inhabits river banks, mountain streams, and other sandy, occasionally inundated places, where it often fills the ground over long distances. Closely allied to Tamarix (from which it differs chiefly in the more numerous and united stamens), it is not so ornamental as various members of that genus. It is easily propagated by cuttings made of stout wood of the current year placed in sandy soil in the open ground in October. It flowers from May to August." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 90.)

Phaseolus mungo L. (Fabaceae.) 39589. Seeds of urd from Manila. Presented by Mr. William S. Lyon. "Seeds of a native Phaseolus. I lay no claim to its virtues as a seed producer; indeed I have it growing cheek by jowl with a number of other species and find it relatively inferior as such, but as a cover crop, I have wholly discarded all the scores of leguminous plants I have tested in favor of this. I have made distribution of the seeds to a number of abaca planters and they are most enthusiastic over its utility in young hemp (Musa utilis) plantations. Like myself they have all come to discredit cowpeas, and all velvet beans, Lyon incuded, for the reason that in good soils the growth of the cover crop is so exuberant that except at great outlay for labor, any plants under one meter tall are smothered out of existence. On the other hand, in old plantations, and which are fairly well shaded, the cowpeas and velvet beans make a spindling and inefficient growth to accomplish the main purpose of choking out a number of objectionable weeds and grasses, which, notwithstanding the shade, flourish to the detriment of the abaca. I have more than an acre now in my rose garden and for two seasons have grown this bean to the exclusion of all others. It makes a low spreading mat about a foot thick and not much disposed to climb. The result is, I am able to plant two crops a year among my dwarf rose bushes without choking them, with a marked saving in cultivation and irrigation, as well as a marked improvement in the quantity and quality of the flowers obtained." (Lyon.)

Phlogacanthus thyrsiflorus (Roxb.) Nees. (Acanthaceae.) 39653. Seeds from Darjeeling, India. Presented by Mr.

G. H. Cave, Curator, Lloyd Botanic Garden. A large evergreen shrub found in the sub-Himalayan tract from Kumaon to Assam, the Khasia Hills and Burma. It is very handsome with long spikes of flame colored flowers. The wood is white, moderately hard and close-grained." (Watt, Dictionary of Economic Products of India.)

Pyrus spp. (Malaceae.) 39538-541. Cuttings of Chinese pears from the Arnold Arboretum, Jamaica Plain, Mass. Presented by the Director, Dr. C. S. Sargent. The species, all of considerable ornamental value, now being studied and soon to be described by Mr. Alfred Rehder.

Pyrus betulaefolia Bunge. (Malaceae.) 39547-548. Seeds from the Arnold Arboretum, Jamaica Plain, Mass. Presented by Mr. Jackson Dawson. "A slender, quick-growing, graceful tree, twenty to thirty feet high; young shoots covered thickly with a grey felt which persists the whole of the year. Leaves ovate or roundish ovate, two to three inches long, one and one-fourth to one and one-half inches wide, long-pointed, tapered, or rounded at the base, regularly and sometimes rather coarsely toothed, downy on both surfaces at first, remaining so on the veins throughout the season, dark green, smooth and lustrous above; stalk one to one and one-fourth inches long, grey-felted like the shoot. Flowers eight to ten together in a corymb, white, each about three-fourths inch across, on a downy stalk three-fourths to one inch long; calyx downy, its short triangular teeth falling away from the small roundish fruit, which is about the size of a large pea, greyish brown with white dots. Native of northern China, introduced to Kew in 1882 through seeds sent by the late Dr. Bretschneider. The chief characteristics of the tree are its quick graceful growth, and small fruits not crowned by calyx teeth. Its fruit would appear to be of no value, but the tree is used by the Chinese as a stock on which they graft fruiting pears." (W. J. Bean, Trees and Shrubs Hardy in the British Isles.) This seed from seedlings grown at the Arboretum from seed sent in 1882 by Dr. Bretschneider. Probably of same lot as trees at Kew. This species can be grown easily for cuttings and experiments are being made with it as a stock for the cultivated pear.

Randia uliginosa (Retz.) Poir. (Rubiaceae.) 39655. Seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Curator, Lloyd Botanic Garden. "A small deciduous tree of eastern, central and southern India, but not commonly found in the more northern parts of the Peninsula. The fruit is used in dyeing as a color intensifier and also in medicine as a remedy for diarrhoea and dysentery. The fruit when boiled or roasted is eaten by the natives as a

A BASKET OF BAHIA SUGAR-APPLES.

The fruit of the Sugar Apple (*Annona squamosa*) known in Brazil as Fruta de Condessa and Pinha, is a tropical fruit of more than ordinary merit. It is cultivated to a limited extent in Florida, but should be certainly be planted much more widely than it is at the present time. In some of the interior regions of Brazil it ranks as one of the most important fruits. The white creamy flesh breaks apart into small segments whose outer extremities are marked by the carpellary divisions on the surface of the fruit. The flavor is sweet, melting, somewhat suggestive of the pineapple and the banana. The specimens shown, which were purchased in the markets of Bahia, Brazil, are of exceptionally fine size, the biggest ones measuring nearly four inches in diameter. Photo No. 14979 by Dorsett, Shamel and Popenoe in Bahia, Brazil, March 10, 1914.

IN THE ARID LANDS OF INTERIOR BRAZIL.

This photograph shows the type of vegetation through which the Brazilian Expedition traveled during its exploration of the catingas or dry lands of northeastern Brazil. It was taken near Joazeiro, on the Rio Sao Francisco, in the interior of the state of Bahia. While no cacti appear in this picture, several species are common in the region. During the very brief rainy season the vegetation comes into active growth, flowers, and produces seed. In the dry months which follow nearly all the plants drop their leaves and the country takes on an extremely desolate appearance. Among the plants of the catinga there are several of economic interest, notably the "imbu" (*Spondias tuberosa*) the golden, plum-like fruit of which plays an important part in the dietary of the natives: the "caroá" (*Neoglaziovia variegata*), a fiber plant which furnishes material for the manufacture of ropes and baskets. Photo No. 14936 by Dorsett, Shamel and Popenoe, Brazil, Feb. 22, 1914.

vegetable either alone or in curries. The leaves are boiled and eaten as greens and also serve as fodder for cattle. The wood is whitish-grey, closely grained, and hard, but not used for any special purpose. The unripe fruits are used as fish poison." (Watt, Dictionary of Economic Products of India.)

Spondias lutea L. (Anacardiaceae.) 39563. Seeds from Bogota, Colombia. Procured through Mr. F. L. Rockwood, clerk of the American Legation. "'Ciruelas.' There is a yellow fruit here, which is in the market about three months of the year. It is reddish yellow, grows on a small tree, like cherries on a small scale. It has never been cultivated but has a very large seed and a pleasant slightly acid taste, and the market name is 'ciruelas,' which is Spanish for plums. They are about three quarters of an inch long and oblong in shape, a very handsome fruit. The season lasts only from June to September. This class of fruit is abundant in the valleys of the Andes in a warm climate where the temperature is from 70 to 80° F., and it seems to do best below the coffee belt in valleys where it is shaded and well watered. The fruit is very popular in this market, especially among the children and seems very healthy to use. The price is higher in proportion to other tropical fruits in the Bogota market, owing to the fact that none is cultivated and dependence is placed upon the wil crop only. This fruit is said to counteract the effects arising from eating too much meat." (Rockwood.)

NOTES FROM CORRESPONDENTS ABROAD.

Philippine Islands. Manila. Mr. Henry H. Boyle on his late visit to America was requested to write a full account of a very interesting practice of the Filipinos which they believe ensures a good crop of mangos. In his letter of March 6, 1915, he gives the following description of "*The smoking of mangos*: A fire is built under the tree, then a bamboo shield is placed so that the smoke from the fire is directed upward through the branches of the tree. In some cases a smoke stack is made out of bamboo and placed under the tree. The fire is built under the hood. This is by far the most efficient method of having the smoke spread through the branches of the tree. The natives of Cavite Province start to smoke the mango trees the first part of August and continue until the flowers have been pollinated and the fruit set. The time consumed in smoking is about one month. Weeds, leaves and rubbish are used for fuel. Care should be taken not to let the materials blaze. This can be prevented by placing rice chaff, banana leaves or sawdust upon the pile to be burned. The smoking is performed upon trees that have and

have not been *nicked* or '*taga*' as they say in Tagalog. The nicked or slashed trees after smoking will produce fruits three months earlier than those that have not been nicked or smoked. The object of the smoking is, according to the natives, to cause the tree to produce flowers earlier and to have the fruit ripen earlier. It also helps to dry the flowers which have become wet from the dew and materially helps to keep down the harmful insects and fungus. The smoking is stopped when the fruit is the size of a marble. Nicking is performed when the tree reaches the age of six or seven years. The time selected is about the first part of November, which is the dry period in the province of Cavite. The tree is first nicked from the ground upward as far on the trunk as it is possible to reach or to the first branch. Care should be taken not to injure the cambium layer to too great an extent. This nicking is done by a sharp bolo. When I first saw the nicking and smoking stunt used on mango trees, I was of the opinion that it was more injurious than beneficial, but now after three years of observation I can readily see that it is a wonderful help to trees raised from seeds. They fruit and fruit earlier than those not treated in the manner described and I have never seen any bad results caused by the nicking or smoking. This is saying a good deal as I have seen mango trees in every large island of the Philippines, treated in the manner described. There is another matter, regarding manos, which I spoke to you about when last in Washington: namely the method employed by the natives for keeping mangos six months. It is as follows: A kerosene tin which holds five gallons is used as the receptacle. An equal amount of second grade molasses and sawdust is mixed or as much molasses as the sawdust will absorb is used. The quantity of the above material used depends upon the amount of mangos placed in the tin. It is however, necessary to have the mangos completely immersed. The tin is then made air tight by soldering. The second grade molasses is cheap here, due to the large number of sugar mills, so the expense thus incurred is very little. I have arranged to have one tin of the first mangos packed in this manner sent to you so that you may see if the method is O. K."

Philippines. Manila. Mr. Wm. S. Lyon writes, March 19, 1915. "A matter of two weeks ago I mailed you a small tin of fresh seed of Chaetospermum but forwarded you no information on same. Since reading Mr. Swingle's monograph on 'Citropsis', I am prompted to ask you whether or not he has successfully worked any standard varieties of the orange on Chaetospermum, and if any tests have yet been made in growing them under arid conditions. I think, but am not quite certain that I wrote to you that this species occurs on well drained gravelly hillsides where seventy

inches of rain falls, practically all of which comes in five months, two to four inches more being scattered over a few inconsequential showers during the remaining seven months. Even in the few years where the rainfall in the dry season exceeds this amount, it is at best, absolutely a negligible quantity, for the reason that the prevailing hot dry winds and unclouded sun will remove every appreciable trace of moisture from the soil a few hours after a fall of from a quarter to half an inch. On the other hand I lost a row of about two dozen three year old seedlings of 'tobug' growing in the undrained land which was nearly, but not quite inundated during a ten day storm in which we had nearly two feet of water fall. At the same time adjacent rows of Mexican limes, and sweet oranges in variety were hardly injured. Some of the water logged 'tobug' which I had dug up, had, for their size, an extraordinary root system, and in porous land, I am of the opinion would penetrate to a surprising depth. Such land uncontrolled by water, is still found in southern California in large areas and I think that if 'tobug' could be tested on such lands and found to thrive on only the normal ten inch rainfall, and responding freely to grafting, that there would be a possible opening for those rainbow chasers whose idea of the sum of all happiness is to end their days on an orange grove in southern California, and who are now deterred by the fabulous prices asked for orange lands which are commanded by water. Of course, being an ultra tropical species, there would be the factor of cold to be reckoned with; but if budded low, the stock, the susceptible part, would practically be under ground and likely to escape serious injury.

"Of relatively new fruits, I now have the 'beriba' *Rollinia sp.*, received from Mr. Fischer some five years ago, now in full flower. It probably makes a much larger tree than most of its congeners, my plant now being some twenty feet tall and with trunks six inches in diameter.

"*Canarium sp.*, the 'pili' nut of commerce, I have now, at six years from the seed fruiting with a first but light crop. The Filipino has already nearly killed the demand for this most excellent dessert nut by husking it in boiling water. This method quickly kills the seed and turns the meat rancid. The average buyer of an expensive food likes to get more than a dozen good nuts in each hundred he pays for. In consequence the shipments of 100,000 bushels of two or three years ago have dwindled down to four or five thousand, and will probably drop to zero. The Filipino may be ready for self government but he has plenty to learn about making the most of his best food products."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
George W. Oliver, Plant reeder and Propagator.
H. C. Skeels, otanical Assistant, in charge of Seed Collections
S. C. Stuntz, otanical Assistant, in charge of Explorer's Notes, Foreign Correspondence, and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 105. **January 1915.**

Genera Represented in This Number.

Annona	39808-816	Ipomoea	39831-833
Citrus	39699	Malus	39829
	39712	Marsdenia	39685
Diospyros	39689	Pittosporum	39728
	39719	Prunus	39743-798
Erythea	39740		39820-826
Ficus	39828	Quercus	39723
Ipomoea	39729-735	Tamarix	39692
	39741-742	Zea	39803-807
	39799-802		

Plates:

Hedge of the Pitanga or Surinam cherry in Bahia, Brazil.
An old Chinese elm in the Lama Temple Yard, Pekin.
An old Mango tree at Alta da Santo Antonio, Itaparica, Brazil.
The White Barked Pine of China.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertae as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Annona cherimola x squamosa. (Annonaceae). 39808-816. Cuttings of nine varieties of the atemoya, a new hybrid between the cherimoya and the sugarapple, from Lamao, Bataan, P. I. Presented by Mr. P. J. Wester, Horticulturist, Lamao Experiment Station. "In 1908, at the subtropical laboratory, Miami, Fla., the writer successfully hybridized the cherimoya and the sugarapple, the sugarapple and the custardapple, the cherimoya and the mamon, and the mamon and the sugarapple. Several hundred seedlings resulted from this work, part of which were planted out in 1910, the hybrids between the cherimoya and the sugarapple showing remarkable vigor and thriftiness. In 1911 hybrid seeds of the same combination from a cross made in 1910 were brought to the Philippines and the seeds sown in March of the same year. These hybrids exhibited the same remarkable vigor and some attained a height of 2.3 meters in one year and bloomed when they were 16 months old. No fruits resulted, however. This year, (1913) in the course of the reorganization work at Lamao, where the plants are growing, it became necessary to transplant the hybrids, and their fruiting is on that account unfortunately delayed for another year." (Wester, Philippine Agric. Review, July 1913.) The further history of these hybrids is told in the Review for February 1914, "The blossoming season of the cherimoya is somewhat in advance of that of the custardapple, but owing perhaps in part to the shock and retardation due to the transplanting, a few flowers appeared in June on one of the transplanted hybrids. One of these was pollinated with pollen from the custardapple (*A. reticulata* L.) with the result that it set, and a fruit developed and ripened October 8, 1913. The following is a description of the fruit: size small, weight 280 grams; length 7.7 centimeters, equatorial diameter 7.6 centimeters; cordiform in shape, with prominent carpels and distinct areoles; exterior yellowish green, almost glabrous; skin very thick and tough; flesh white, tender and melting, with a slight trace of fiber, juicy, subacid, rich and aromatic; flavor excellent, very similar to a good cherimoya with a dash of the delicate sweetness of the sugarapple; seeds 4 to 7, similar in shape to cherimoya seed but darker colored. The fruit is rather small but regular and well shaped, about the size of a sugarapple, which was to be expected considering that the father parent, the cherimoya, was also undersized. With the employment of large-fruited cherimoyas for the breeding work we may also anticipate a progeny with larger fruits. The atemoya plants, of which there are 23 that have not yet fruited, are very similar in appearance to the cherimoya, and the fruit is also practically identical with the prominent-carpelled cherimoyas. Superior to the sugarap-

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

ple, it is not claimed that the atemoya is an improvement upon the cherimoya, but it has been hoped that by crossing the cherimoya with the sugarapple the excellent flavor of the subtropical cherimoya, which does not succeed well in the low altitudes near the equator, might be imparted to the progeny, and that the other parent from the lowlands would impart to it adaptability to a tropical climate. It would seem that this anticipation has been realized in the above instance. The name 'atemoya,' which is here being proposed for this new race of fruits, is derived from a combination of one of the old original names of the sugar-apple, Ate pannicensis, quoted from Hernandez, in his work 'Nova Plantarum Animalium et Mineralium Mexicanorum Historia,' published in 1651, and cherimoya." (Wester.) Of the nine plants represented by cuttings, No. 39809 represents the plant which fruited in 1913, the remainder first bore fruit in 1914.

Citrus bergamia Risso. (Rutaceae.) 39699, 39712. Seeds of the bergamot orange from Naples and Catania, Italy. Presented by the American consuls. "A small tree: leaves oblong-oval, with long, winged petioles: flowers small, white, very fragrant: fruits pyriform, three-fourths inch in diameter, thin-skinned, pale yellow when ripe: pulp acid: seeds oblong, many. Extensively cultivated in Calabria for the essential oil which is expressed from the peel and used in making eau de Cologne and other perfumes." (Swingle, in Bailey, Standard Cyclopedia of Horticulture.)

Diospyros ebenaster Retz. (Ebenaceae.) 39698, 39719. Cuttings and seeds of the black sapote from Sante Fe, Isle of Pines, Cuba. Presented by Mr. H. S. Jones. "The sapote prieto or sapote negro (black sapote) of Mexico, an interesting fruit belonging to the persimmon family. The tree grows in compact shapely form, and is of very ornamental appearance with its oblong-oval, glossy leaves about 4 inches long. In appearance the fruits greatly resemble some varieties of the Kaki or Japan persimmon; in place of being bright orange, however, they are light green when ripe, and measure $2\frac{1}{2}$ to 3 and even 4 inches in diameter. In shape they are oblate or distinctly flattened and the pesistent, light green calyx is quite prominent. The interior of the fruit, when ripe, is anything but attractive in appearance, the flesh being dark brown or almost black in appearance, and of a greasy consistency. The flavor is sweet but rather lacking in character; for this reason the Mexicans frequently serve the fruit cut up, or mashed up, with orange juice; it is a first rate dish. The seeds

look like those of the persimmon and are not very numerous. According to Mr. Jones, the fruit ripens in the Isle of Pines from the last part of December to the middle of February. The tree is rare outside of certain parts of Mexico, but has done well at Mr. Jones' place. It seems worthy of much wider dissemination throughout the tropics. Types from the cooler parts of Mexico have withstood a little frost in Southern California, yet the trees cannot be considered very hardy." (Wilson Popenoe.)

Erythea edulis (Wendl.) S. Watson. (Phoenicaceae.) 39740. Seeds of the Guadeloupe Island palm from Santa Barbara, Calif. Presented by Mr. W. H. Morse, through Mr. O. F. Cook, of this Bureau. "This palm has been found in the wild state only on Guadeloupe Island, off the coast of Lower California, but it has been planted widely in the coast region of California and undoubtedly is one of the finest, and at the same time one of the hardiest of the whole series of ornamental palms. In California it appears to be more hardy than Washingtonia, and since Washingtonia is being grown at Charleston and other Atlantic Coast points, the Guadeloupe Island palm may also be able to survive. At least it should be given a fair trial. It may not be as well suited to Florida, on account of the hot humid summer. Trachycarpus also does not thrive there in summer. I would suggest that seedlings be grown for experimental planting in the Carolinas and other Atlantic Coast states." (Cook.)

Ficus sp. (Moraceae.) 39828. Cuttings of a fig from Rome. Presented by Dr. Gustav Eisen. "Harrar. A fig from Abyssinia, most interesting and different from *Ficus carica*. Possibly a variety of *Ficus pseudocarica*. Fruit medium, outside violet brown, pulp reddish brown-vermilion, brilliant. Sweeter and better flavored than any other variety when full ripe. Growth of branches somewhat pendent, leaves like *Broussonetia papyrifera*. Abundant bearer and hardy. Suited, I think, to Texas, Arizona and southern California. May also do well in some parts of the south as it can stand considerable summer rains." (Eisen.)

Ipomea batatas (L.) Poir. (Convolvulaceae.) 39729-735, 39741-742, 39799-802, 39831-833. Tubers of sweet potatos from Cuba. Presented by Mr. Juan T. Roig, Botanist, Agricultural Experiment Station, Santiago de las Vegas. Sixteen varieties for the experiments of the Office of Horticultural and Pomological Investigations.

Malus sp. (Malaceae.) 39829. Cuttings of an apple from Rome. Presented by Dr. Gustav Eisen. "Limoncella or

HEDGE OF THE PITANGA OR SURINAM CHERRY IN BAHIA, BRAZIL.

Although the Surinam cherry (*Eugenia uniflora*) has become a well known shrub in Florida its frequent use as a hedge in Brazil may suggest a similar use for it in Florida. It is an evergreen and its crimson fruits ripen throughout the winter and when perfectly ripe are very palatable. It is not spiny and in this respect is inferior to Carissa. Photo No. 15283 by Dorsett, Bahia, Brazil, Nov. 25, 1913.

An Old Chinese Elm in the Lama Temple Yard, Pekin.

The Chinese Elm (*Ulmus pumila*) has proven to be perfectly hardy in the North West and is attracting considerable attention because of its rapid growth and attractive appearance. It cannot compare with the American elm as an avenue tree but has a picturesqueness about it which will make it a useful tree for dooryards and parks. Photo No. 5103, by F. N. Meyer, Pekin, China, Dec. 25, 1905.

Limoncello apple. Middle and southern Italy, especially Naples, down to and including Sicily. The only apple adapted to a warm and dry climate, at the same time possessing qualities which compare favorably with those of good northern apples. The best variety of apple grown in Italy for the general market. Medium or below medium, apex truncate, constricted below the apex, wider at base. Oblong, much longer than wide. Stalk short, slender, core long, narrow, solid, with very few seeds, flesh solid, white, sweet and subacid, crisp and juicy. Color of skin lemon yellow, shaded to a very slight pinkish flush. Flavor strong, agreeable, resembling that of certain red Cabernet grapes. Very fine shipper. Ripe from end of November to February. This variety is not to be preferred to our better American apples in the northern states, its value consisting in its adaptability to warm countries where the northern apples do not thrive. Should do well in California, Arizona, and Texas, in localities with deep and rich soil. It is superior to any California apples grown on the central and southern plains and compares well with those grown in the mountains, except as to size. Retails at 35, 40 to 50 centesimi a kilo, or from one-half to one cent American each, more or less according to size." (Eisen.)

Marsdenia tenacissima (Roxb.) Wight & Arnott. (Asclepiadaceae.) 39685. Seed from the Royal Botanic Garden, Sibpur, near Calcutta, India. Presented by Mr. G. C. Calder. "A climbing plant distributed throughout the lower Himalayas, ascending to 5000 feet from Kumaon to Assam and Burma. The plant is fond of dry barren localities, twining on the bushes and small trees. The bark of the stem yields a large quantity of beautiful fine silky fiber which is extracted by cutting the stems into sections and then scraping them clean with the finger nails or with a stick. The mountaineers of Rajmahal make their bowstrings from this fiber because of its strength and durability. In Dr. Roxburgh's test of twine made from this fiber he found that in the dry and wet states it bore a strain of 248 and 343 pounds, when hemp in the same state bore 158 and 190 pounds. More recent tests however, place it below hemp in strength, but above it in elasticity . The fiber is much used in making fishing nets and is not liable to injury by submersion in water. One of the chief characteristics of this fiber is its elasticity and it is considered to be the second best fiber in India. This species, though producing a good fiber is not in general cultivation, for, being a climber, difficulties exist with which the Indian cultivator has not attempted to deal. A milky juice exudes from the cuts on the stems which thickens into an elastic substance which acts in the same way

as India rubber in removing black lead marks." (Watt, Dictionary of Economic Products of India, and Dodge, Useful Fiber Plants of the World.)

Pittosporum macrophyllum Laut. & K. Sch. (Pittosporaceae.) 39728. Seeds from Nice, France. Presented by Dr. A. Robertson-Proschowsky. "The plant has existed in my garden for more than 20 years. It is the most beautiful of the dozen or so Pittosporum species which I cultivate. The leaves occasionally attain nearly the size of those of *Magnolia grandiflora* and the flowers are perhaps not surpassed in fragrance by any other flower. Indeed the fragrence is most exquisite. Would such highly fragrant flowers not be of value for the extraction of perfume?" (Proschowsky.)

Prunus pseudo-cerasus Lindl. (Amygdalaceae.) 39743-798, 39820-826. Cuttings of sixty-three varieties of Japanese flowering cherries from Tokyo, Japan. Presented by the Arnold Arboretum through its collector, Mr. E. H. Wilson. The Arnold Arboretum sent Mr. E. H. Wilson to Japan last year for the purpose, among other things, of arranging for an authentic named collection of the Japanese Cherry Blossom trees. Mr. Wilson secured botanical specimens of a large private collection of these trees and the budwood was taken by him personally from the same trees and the budwood from each variety was given its own correct Japanese name by the owner of the collection who is known to be an authority on cherry blossom trees. This collection will be propagated and sent out under a cooperative agreement with the Arboretum and under these authentic Japanese names made permanent by Mr. Wilson's herbarium specimens.

Quercus insignis Mart. & Gall. (Fagaceae.) 39723. Acorns of a white oak from Zacuapam, Vera Cruz, Mexico. Purchased from Dr. C. A. Purpus. "They were sent to me by a friend Sr. Guillermo Ziche from Huatusco and were collected in the Sierras west of town at about 1500-1600 feet altitude. I am sure you will be able to grow them in the southern part of Florida where the palms (*Roystonea regia*) grow. They need a moist climate, sub-tropical forests do well." (Purpus.) "The tree is rapid in growth, and quite different in habit from most oaks. It reaches an ultimate height of 60 to 80 feet or more, is quite erect, and sends out large branches at the height of 30 or 40 feet above the ground. It is found in considerable abundance about midway down the flanks of Mount Orizaba, being most common about Chiapas, according to Dr. C. A. Purpus, who has recently been collecting in that region. It is a white oak, maturing its fruit the first season; and being a white oak, its

fruit has sufficient edible quality to be available at least as stock food. 'The only other oaks that approximate it in size', according to Dr. William Trelease of the University of Illinois, who directed the attention of the American Genetic Association to the species, 'are a close relative, *Q. strombocarpa*, of the same region, and a Guatemalan black oak, *Q. skinneri*, the latter apparently an equally large tree, and with acorns two inches in diameter but presumably bitter or astringent like our own black acorns.' The nuts of the *Q. insignis* are usually about two inches in diameter but may reach two and a half inches. Their weight is from 50 to 65 grams each. In view of its range, the tree is naturally to be supposed unsuited to a temperate climate, but Dr. Purpus writes, 'I think it a very useful tree which could be raised in Florida, Cuba, Porto Rico, etc.' If it is found to be well adapted, it is possible that native species of oaks could in some cases be grafted over with the more productive new one, thus yielding a large crop of acorns with very little trouble or care. Hybridizing experiments should also be tried with some of the best North American oaks, with a view to seeing whether the size of their acorns cannot be increased." (Journal of Heredity, vol. 5, no. 9, p. 406.)

Tamarix pentandra Pallas. (Tamaricaceae.) 39692. Seeds of a tamarisk from the Tiflis Botanic Garden, Tiflis, The Caucasus. Presented by the Director. "A deciduous shrub or small tree, ultimately from 12 to 15 feet high, or upwards, with long, slender, plumose branches. Leaves very small, pointed; the largest one-eighth inch long, arranged at intervals along the flowering shoots; the smallest one-fifth as large, and crowded fifty or more to the inch. Flowers arranged densely in slender, sometimes branching racemes, 1 to 5 inches long, each tiny blossom one-eighth inch across, rosy pink; they cover the whole terminal part of the current year's shoot, which is this transformed during August into a huge plume-like panicle of blossom as much as 3 feet long. Sepals, petals, and stamens, all five in number. Native of southeastern Europe and Asia Minor, especially on the banks of tidal rivers. This beautiful tamarisk is quite hardy, and one of the most pleasing of late-flowering shrubs. It should be planted in groups large enough for its soft rosy plumes to produce an effect in the distance. To obtain it at its best, it is necessary to cut it back every winter almost to the old wood. It then sends up the long slender branches which flower for six weeks or so in August and September. It is propagated with the greatest ease by making cuttings, 6 to 9 inches long, in early winter of the stoutest part of the season's growth, and putting them in the ground out-of-

doors, like willows. It has been called a variety of *T. hispida*, but that species, as stated above, is very distinct in its downy twigs and leaves." (W. J. Bean, Trees and Shrubs Hardy in the British Isles.) As a wind break plant the Tamarisk is proving to be very valuable on the Great Plains and it is recommended for this purpose.

Zea mays L. (Poaceae.) 39803-807. Seed of maize from Oroya, Peru. Collected and presented by Dr. J. N. Rose, U. S. National Museum. "Corn obtained from Chola women, July 1914, altitude 12200 feet." (Rose.) Five varieties including light yellow, mixed blue and white, brownish and red.

NOTES FROM CORRESPONDENTS ABROAD.

China. Kiayingchow. Rev. George Campbell writes April 13, 1915. "You refer, of course, to the water buffalo. As I write, people are using these animals in ploughing their rice fields. The are exactly fitted for plouhing and harrowing in the deep mud, and wallow through the fields dragging the ploughs after them as no other animal could. They are never used here as pack animals, and we have no carts or vehicles of any kind. While I was at home, in 1913, there was some talk of making a cart road from here to a market town 17 or 18 miles north, and an enterprising native came to my daughter to borrow a mail order catalogue and see what carts to be drawn by buffaloes would cost. Nothing came of it, however, and I hear no more about the road. They are used in some places to a limited extent to supply milk. I suppose there may be 20 or more so used in this city.

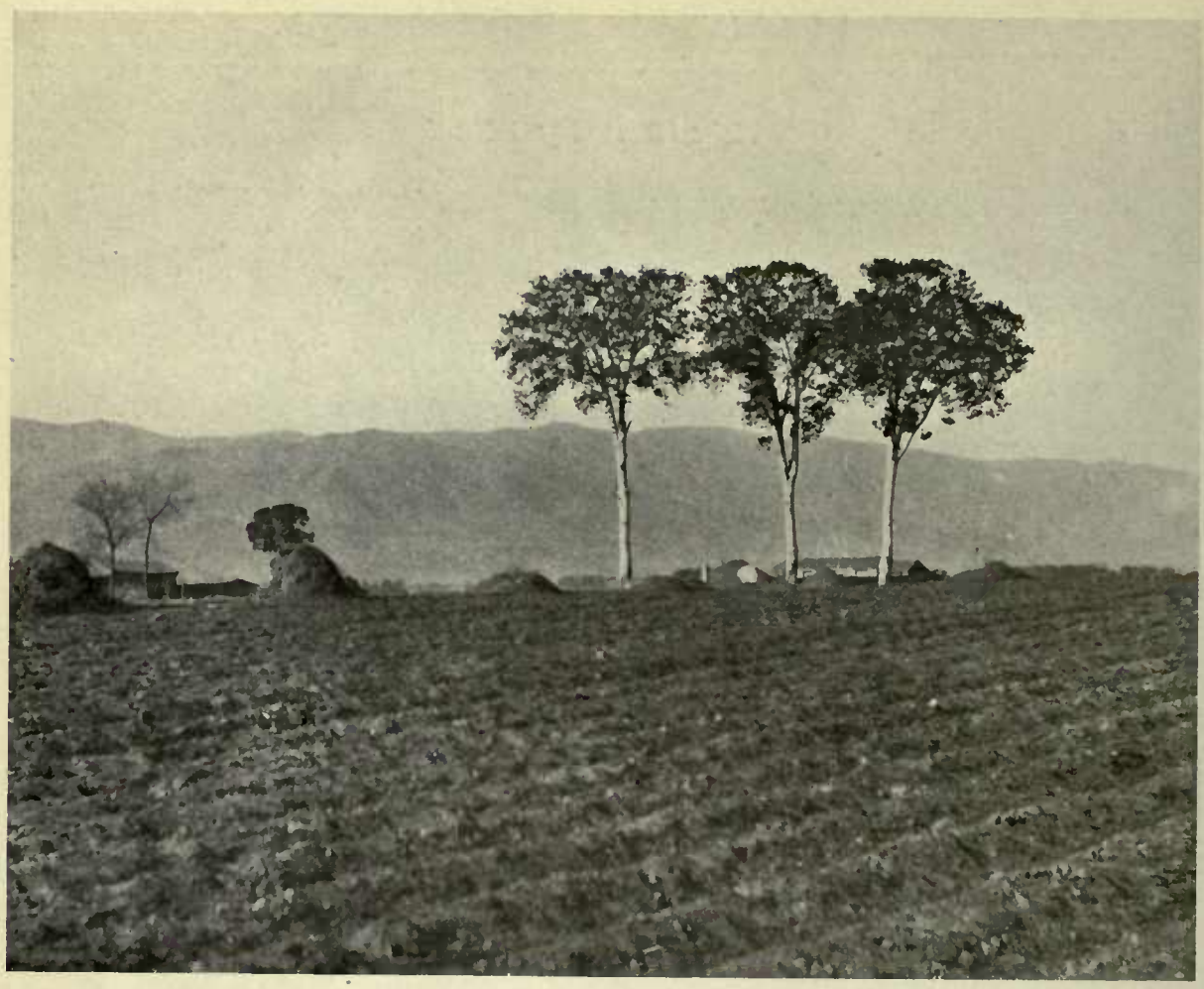
"The loquats are just coming into the market now. They are our earliest fruit. They vary greatly in size and the seeds are usually very large. The trees thrive and come into bearing early. The branches tend to split at junction with the trunk and borers attack the trees, caterpillars also.

"Tobacco is a couple of feet high and the fields are invariably edged with taro. Beans are growing well and are extensively planted. Wistaria and Pride of India are in bloom, and grapes are leafing out a little. Peaches and almonds are as large as hickory nuts. Mulberries are loaded to the ground with fruit. One plant of rhubarb is doing very well.

"I stumbled on something the other day while at an out-station which may interest you. A tailor who has been abroad (Rangoon) called on me and asked if anything could be done for his 10 year old son who has epilepsy. I enquired about his heredity. He told me that he bought the

An Old Mango Tree at Alto Da Santo Antonio, Itaparica, Brazil.

Although a native of Asia the Mango (*Mangifera indica*) was introduced into South America so early that giant trees of it are often found there. Few fruit trees reach a larger size and bear fruit longer than the mango. The illustration is of a seedling tree but very old grafted trees occur in India and certain of the Philippine varieties of delicious quality come true to seed. Photo No. 14556 by Dorsett, Dec. 24, 1913, Bahia.



The White Barked Pine of China.

A trio of white barked pines (*Pinus bungeana*), growing in a field about twelve miles west of Pekin, China. There is little that is particularly attractive about this pine when it is young but in its old age it is said to rank among the most striking of landscape trees because after fifty years old the outer bark flakes off and the trunk becomes almost as white as that of the birch. Photo No. 5015 by F. N. Meyer, taken Dec. 29, 1915, near Pekin.

child while on a trip to Sz-chwan Province. He was one of five boys all sold by the parents to furnish funds for opium and gambling, but he was the last one sold - perhaps because unsound. But what interested me was the errand that took him a thousand miles or more from home.

"He was peddling *Chang-hiong kien*, a sort of cloth made from cocoons spun by the wild silk worm, the manufacture of which is the most ancient industry of this region. *Chang-hiong* is the ancient name of this city, which has been famed for many centuries as the place where alone this fabric is made. It is a sort of *khaki* color and very strong and little affected by exposure to moisture. It is regarded as the best thing for shrouds and supposed to last until bodies wrapped in it mold to dust. Of late years, and especially since the establishment of the republic, it has become less popular and hard to sell.

"The eggs are obtained from the Province of Honan (the cradle of the Hokkas, as you will see in my 'Origin and Migrations of the Hokkas') and the worms feed on a variety of trees. The worms are larger, healthier, and spin larger cocoons than the domestic variety.

"Since the cloth declined in value quite a trade has sprung up in the cocoons, which are bought by agents of Japanese firms and shipped to that country, usually in June and July.

"It occurs to me that this material may be adapted to some specialized use by its peculiar qualities. It comes in pieces 8 or 9 yards long and about 15 inches wide, selling at present for about $7 Mex. The cocoons are boiled and sold partly by weight and partly by number. They might be worth something in U. S. A.

"The business has of late years been carried on mainly by one family or clan. The cocoons are furnished and weavers are paid for making the cloth. Peddlers went in every direction with the cloth and penetrated to distant provinces.

"This city was the center of the human hair industry so prosperous six or eight years ago, and this family went into it largely, collecting hair in a radius of a thousand miles. That business was overdone, though fortunes were made for a while, and this trade in cloth was neglected, and I had supposed was about defunct.

"I will look into this further, if you think it worth while. I understand some hundreds of pieces are still made every year, or can be if the cocoons are not otherwise disposed of."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers
George W. Oliver, Plant Breeder and Propagator.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorer's Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF FORESTRY DIVISION
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 106. February 1915.

Genera Represented in This Number.

Abies	39860	Euonymus	39903
	39983-987	Hicksbeachia	39871
Acer	39988	Malus	39923
Amygdalus	39898	Prunus	39899
Betula	39989-991		39902
Castanopsis	39909		39911
Citrus	39875		39918
	39897	Ribes	39910
Corylus	39907		39916
Daphne	39914	Salix	39921-922
Deringa	39869	Tamarix	39856
Diospyros	39912-913	Viburnum	39998

Plates:

Amygdalus tangutica. A Chinese Wild Almond.
Citrus sp. from Kansu, China.
Prunus persica potanini. Potanin's Chinese wild peach.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

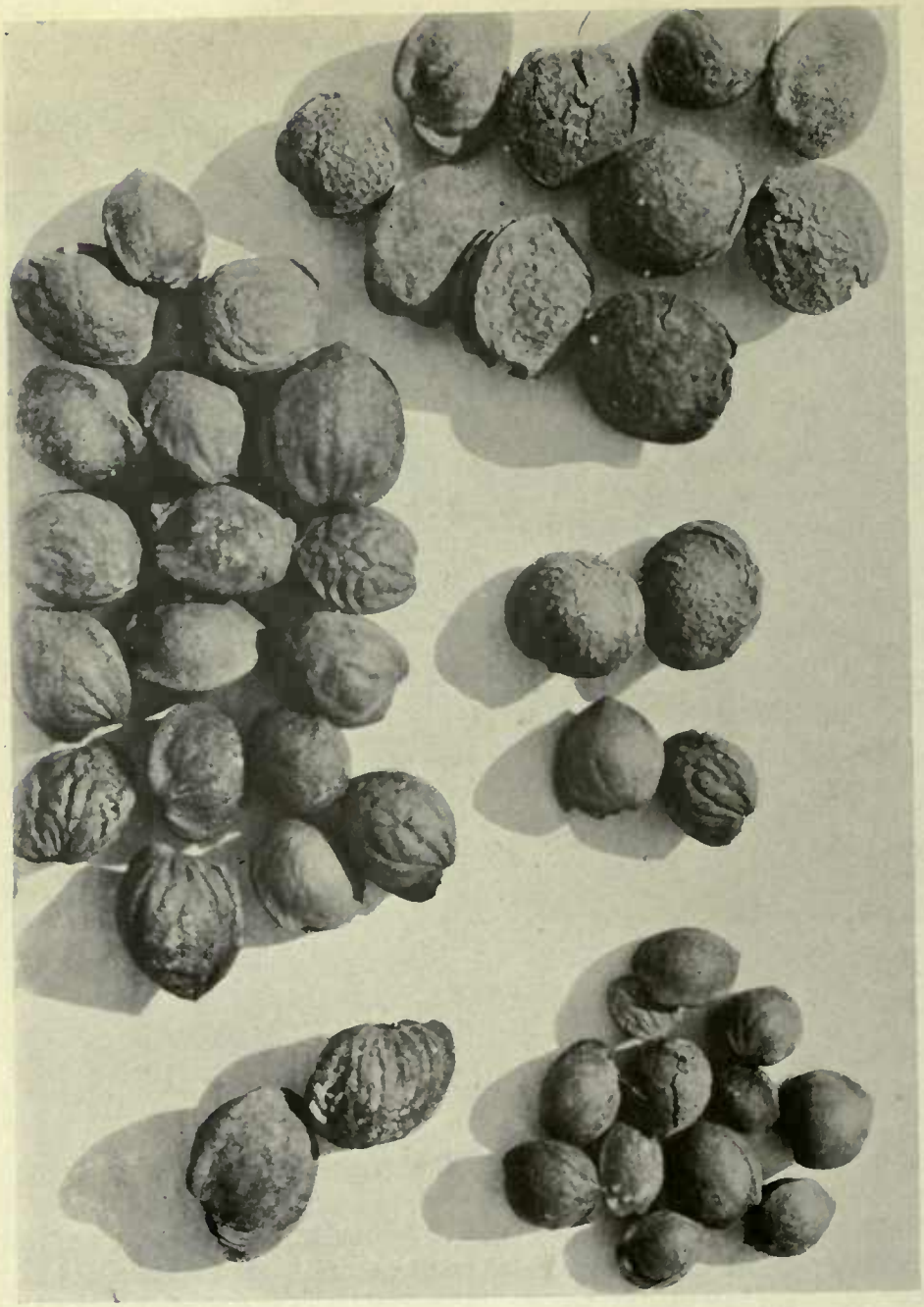
Abies spp. (Pinaceae.) 39860, 39983-987. Seeds of Japanese firs received through the Arnold Arboretum, Jamaica Plain, Mass., from the collections of Mr. E. H. Wilson. *Abies mariesii* Masters, one of the rarest of silver firs, *A. sachalinensis* (Schmidt) Masters, attaining 130 feet in height, and probably very hardy, *A. umbellata* Mayr, a beautiful hardy tree, and a variety of *A. veitchii* Lindl., with olive yellow cones, an especially handsome small conifer.

Acer capillipes Maxim. (Aceraceae.) 39988. Seed of a Japanese maple received through the Arnold Arboretum from the collections of Mr. E. H. Wilson. A handsome maple closely allied to *A. pennsylvanicum*, which it resembles in the shape of its leaf, but is distinguished by its lack of down on leaves and young wood.

Amygdalus tangutica (Batal.) Korsh. (Amygdalaceae.) 39898. Cuttings of the Tangutian almond from the village of Lan tsai, Kansu, China. "A bush almond found in rocks and cliffs along the right bank of the Siku river, collected at an elevation of 4200 feet. Shrubs from 4-10 feet high, in sheltered places reaching even a height of 20 to 25 feet, densely branched, branches often running zigzag, and ending in spines. Foliage small and of a glaucous green color. Fruits very variable in size, looks and shape; skin downy and thin, stones ranging in size from a cherry stone up to a good-sized apricot stone, of many forms, some round and quite smooth, others pointed or heartshaped and grooved like peach stones, shells moderately thin, kernels small on the average and quite bitter; they are, however, eagerly collected by ground squirrels. Here and there local Chinese also collect them and express a clear oil from the kernels for culinary purposes. These kernels are also sparingly eaten after having been boiled first so as to remove part of the bitter flavor. This Tangutian almond occurs in many places in the province of Kansu, growing at elevations from 4000 to 10000 feet. It is able to withstand a great amount of drought, cold and dry heat. It is recommended as a factor in certain hybridization experiments, to create hardy bush almonds. As a stock for almonds it might be tested, but since it throws up so many shoots from the base it may not have any commercial value for this purpose. As a hedge plant for dry regions it also possesses value, while as an ornamental spring flowering shrub it possibly could be employed in gardens and parks in the cooler parts of the semi-arid United States. Chinese name *Yeh hsiao hsing*, meaning 'wild small apricot,' also *Mao tao'r* meaning 'hairy peach.'" (Frank N. Meyer's introduction and description.)

The Tangutian almond (*Amygdalus tangutica*, S.P.I. No. 39898).

A large bush growing out from the crevice of a large rock. Such a situation indicates the remarkable drought resistant quality of this almond. It is found at elevations of from 4000 to 10000 feet and can stand great drought, cold and dry heat. Photo No. 13095 by Frank N. Meyer, Lan Tsai, Kansu, China, Oct. 29, 1914.



Tangutian Almonds (*Amygdalus tangutica*), S.P.I. No. 39898.

The illustration shows the variation in size and form. The kernels are bitter but edible after boiling. The bushy character of this almond may make the species valuable for hybridization purposes to produce a hardy commercial bush almond. Natural size photograph No. 13093 by Frank N. Meyer, Siku, Kansu, China, Nov. 15, 1914.

Betula spp. (Betulaceae.) 39989-991. Seeds of Japanese birches received from the Arnold Arboretum, from the collections of Mr. E. H. Wilson. *Betula schmidtii* Regel, a stately tree from southeastern Manchuria, *B. pendula japonica* Miq., and *B. ulmifolia* Sieb. & Zucc., a native of Japan, and very rare in cultivation, attaining a height of 50 to 70 feet.

Castanopsis sp. (Fagaceae.) 39909. Cuttings from near Pao dji, Kansu, China. "A small tree found in between tall scrub on protected mountain sides at 8000 feet elevation. Bears burrs like those of a chestnut, which contain chinquapin-like nuts; it bears, however, also catkins like a hazel or an alder when it is leafless. Leaves somewhat like those of a chestnut but of a thinner and less persistent structure. Of value possibly as a new nut-bearing tree, fit for regions where the winters are not too severe." (Frank N. Meyer's introduction and description.)

Citrus sp. (Rutaceae.) 39897. Cuttings from near Lian dja pa, Kansu, China. "A peculiar species of citrus growing into a large tree, bearing loose-skinned, round, flattened fruits the size of mandarin oranges. Color of rind light-yellow; rind full of oil-glands, smelling like a fine lemon; segments separating easily; fairly juicy and of an agreeable sharp sour taste; contains plenty of large seeds. These sour mandarin fruits make a very pleasing lemonade cut up with rind and all in a tumbler of water and some sugar added. They also taste well when cut up in slices in hot tea, while a few pieces of rind added to a soup or stew gives a novel and agreeable flavor. The trees are of thrifty growth, making large heads of dark-green foliage, they are prolific bearers, apparently; young shoots armed with large spines. They are not grafted or budded but propagated from seeds only. This citrus is found at elevations from 2000 to 4500 feet, and where they grow one finds the following trees cultivated: *Diospyros kaki*, *Ficus carica*, *Punica granatum*, *Juglans regia*, *Pyrus sinensis*, *Morus alba*, *Hovenia dulcis*, *Ligustrum lucidum*, *Chamaerops excelsa* and *Phyllostachys sp.* Of value possibly as a tree for the home garden in sections north of the citrus belt proper." (Frank N. Meyer's introduction and description.)

Corylus ferox tibetica (Bat.) Franch. (Fagaceae.) 39907. Cuttings of a hazel from near Pao dji, Kansu, China. "A hazelnut growing into a tree from 80 to 100 feet tall, having a trunk often a few feet in diameter. Bark reddish brown and peeling off in loose layers, like that of a birch.

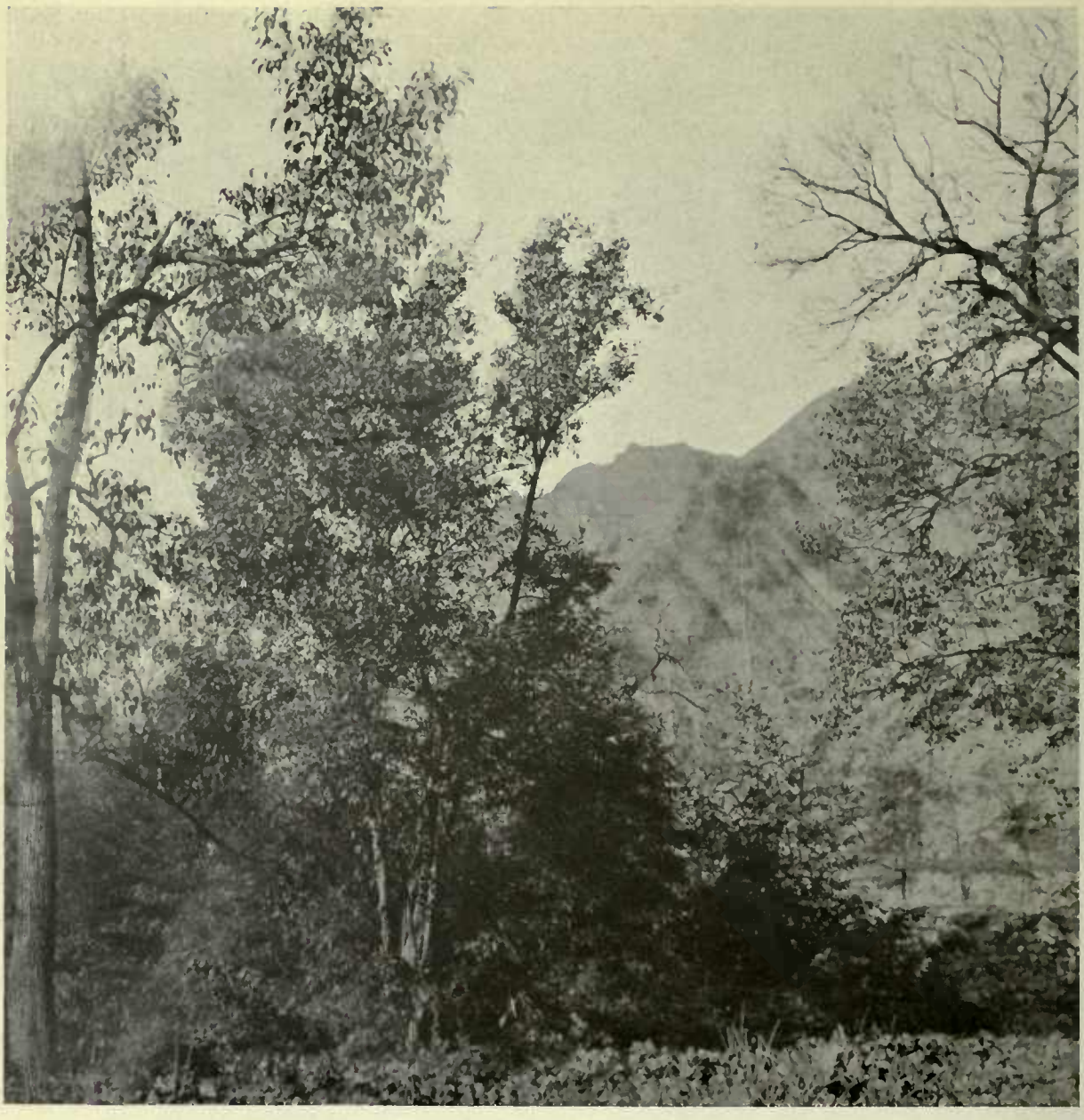
Leaves large, of elliptical shape, petioles long, nuts small and each enclosed in a protuded involucre; they are borne in clusters from 2 and 3 up to 7 and 8. Shell very thick; kernels small, but edible. This hazel-tree bears masses of catkins at the time the leaves come out; it looks very much like a birch or an alder and aside from its having a utilitarian use as a nut bearing tree, it also has a decided value for ornamental purposes, especially when planted in a group or a grove of some extent. Through selection and by hybridization possibly, strains can be obtained bearing larger nuts with thinner shells and possessing commercial value. The climate where these hazels thrive is not a very severe one and the trees probably will not be able to stand extreme temperatures. Collected at an elevation of 7000 feet." (Frank N. Meyer's introduction and description.)

Daphne tangutica Maxim. (Thymelaeaceae.) 39914. Rooted plants of a daphne from near Siku, Kansu, China. "A very beautiful evergreen bush of low and compact growth; foliage dark green and leathery; occurring on stony debris in sheltered ravines and in open woodlands at altitudes from 5000 to 10000 feet. Flowers white with a slight violet tinge, faintly scented, appearing in early spring, though some stray ones can be seen in autumn also. Berries bright red and ripe at the end of May and in early June. This shrub is of high decorative nature; it can be employed especially near houses and low walls and may succeed in such sections of the United States where the winters are not too severe, like Long Island, for instance. The plant is apparently easy to propagate from root cuttings, for roots that were seen sticking out amidst pebbles and stony debris and of which the top parts had been chopped off were observed to put forth new sets of branches. In the mountains to the north of Siku, where this Daphne occurs in abundance, one also finds great quantities of *Buxus sempervirens* and an evergreen species of Pteris, while ivy clings here and there against the rocks; this all often conveying the impression as if man had brought these plants together here and had made a wild garden of it." (Frank N. Meyer's introduction and description.)

Deringa canadensis (L.) Kuntze. (Apiaceae.) 39869. Seeds of honewort from the Brooklyn Botanic Garden. Presented by the Director, Dr. C. Stuart Gager. This native American herb, formerly known as *Cryptotaenia canadensis* DC., Japan, is described by a recent Japanese visitor to America, Mr. T. H. Kuwashima, of Mito, as one of the highest

Citrus Fruits of the Mandarin type, S.P.I. No. 39897.

These have a light yellow rind with peculiar oil glands, a lemon odor and an agreeable sharp sour taste. May prove of special value because of the unusual hardiness of the tree. From near Lian dja pa, Kansu, China. Natural size photograph No. 13140 by Frank N. Meyer, Oct. 20, 1914.



Citrus sp. from Mountains of Kansu, China.

Tree in center is of the Citrus species (S.P.I. No. 39897) exhibited on the previous plate. Found at elevations of 2000-4500 feet in the Province of Kansu, China, by Mr. Frank N. Meyer, who reports it to be a thrifty species, a prolific bearer and in his opinion adapted to sections north of the Citrus belt. Photo No. 13141, by Frank N. Meyer, Siku, Kansu, Nov. 13, 1914.

priced vegetables cultivated in Japan, the young shoots being used as an excellent salad. The little book by Professor Tanaka, Useful Plants of Japan, issued by the Agricultural Society of Japan, says concerning it: "*Mitsuba*, *Mitsuba-jeri*, a perennial herb of the order Umbelliferae growing wild in moist valleys, but much cultivated from seeds or by dividing the roots. In spring young leaves come forth to a height of about one foot. They are eaten boiled, and the roots can also be eaten fried. One variety with fine thread-like petioles and shooting bushes to 8-10 inches high is called *Ito-mitsuba* (thread honewo t.)" Apparently worthy of trial by American amateurs.

Diospyros kaki L.f. (Ebenaceae.) 39912-913. Cuttings of persimmons from Kansu, China. 39912, "from near Kwa tsa, a remarkably large and beautiful persimmon of very flat shape and bearing some furrows on top. Color bright deep orange; seedless, non-juicy, of excellent keeping qualities; can be eaten fresh or dried; not free from pucker. Quite a rare variety. Local name *Momo sze tze*, meaning 'loaf of bread persimmon,' though many different forms pass under that name;" and 39913, "a persimmon of square shape, bearing generally a constriction close to the peduncle, also often furrowed vertically. Of light orange color, seedless; non-juicy; a very good keeper but of astringent properties when eaten fresh, therefore consumed when roasted or steamed, by which processes the pucker disappears for the greater part; also much eaten dried. Chinese name *Fang sze tze*, meaning 'square persimmon.'" (Frank N. Meyer's introductions and description.)

Euonymus sp. (Celastraceae.) 39903. Cuttings from near Ka go ba, Kansu, China. "A spindle wood, growing into a medium-sized tree with a dense, well rounded head of branches. Leaves round elliptical, of opaque green color and somewhat wrinkled. Collected at an elevation of 8000 feet. Of value as an ornamental park tree for the cooler sections of the United States." (Frank N. Meyer's introduction and description.)

Hicksbeachia pinnatifolia Mueller. (Proteaceae.) 39871. Seeds from Burringbar P. O., New South Wales. Presented by Mr. B. Harrison. "Red bush nuts. This tree grows to a height of 30 or 40 feet and the fruit is borne in racemes, attached to the bark and branches of the tree, each carrying 10 or 12 fruits. The flavor is not quite so good as the Queensland nut, *Macadamia ternifolia*, nor does it keep so well, but nevertheless they are sold in some fruit shops

here at 12 cents per pint. I do not think they have been cultivated anywhere in the United States, but could easily be grown in any of the warm southern states." (Harrison.)

Malus sp. (Malaceae.) 39923. Cuttings of a crab-apple from Lien hua shan, Kansu, China. "A peculiar species of crab-apple, bearing its small fruits in bunches. These fruits are of the size of peas, are bright red and possess an agreeable sour flavor; they probably could be well utilized for preserves. The trees are of somewhat dwarf growth and seem remarkably hardy. They may be of value as stocks, as ornamental trees for northern regions, and for breeding purposes. Collected at an elevation of 9000 feet." (Frank N. Meyer's introduction and description.)

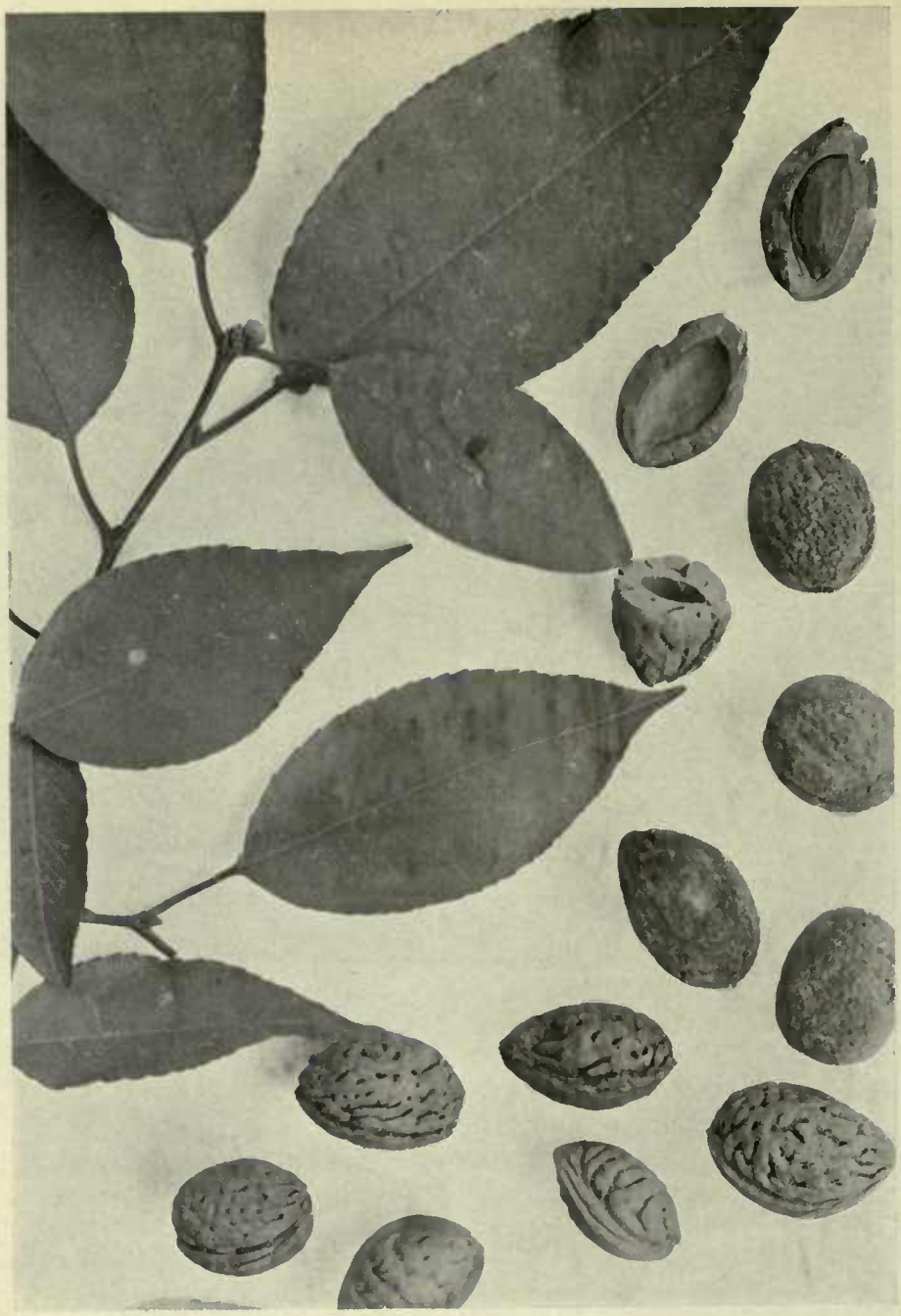
Prunus persica potanini Batalin. (Amygdalaceae.) 39899. Cuttings of a wild peach from the village of Tchu tsai tze, Kansu, China. "A wild peach of the *davidiana* type, but differing from it in various points. Collected at the base of sheltered mountains at an elevation of 4300 feet. A tall shrub or even small tree, up to 30 feet in height, bark of stem or trunk dark reddish-brown and quite smooth in the younger shoots; leaves like those of *Amygdalus davidiana* but often broader in the middle and always less pointed. Fruits of round-elongated form; skin covered with a heavy down, no edible flesh; stones of elliptical shape, grooves longer than in *A. davidiana*, shells very hard and thick, kernels elongated and relatively small. Found growing at elevations from 4000 to 7000 feet, in side valleys away from the Siku river; thrives especially well in sheltered and warm mountain pockets. Of value especially as a stock for stone-fruits and possibly able to stand even more dry heat than *A. davidiana*; also recommended as an ornamental spring-flowering tree, especially for the drier parts of the United States. Chinese name *Mao t'ao*, meaning 'hairy peach.'" (Frank N. Meyer's introtion and description.)

Prunus spp. (Amygdalaceae.) 39902, 39911, 39918. Cuttings of three species from Kansu. *P. brachypoda* Batalin(?), a wild cherry, the leaves of which color up beautifully in the autumn, and which may have value as a stock, *P. setulosa* Batalin, of possible value as a stock and for breeding purposes, and *P. stipulacea* Maxim (?), of possible value as an ornamental shrub, as a stock, and for breeding purposes. (Frank N. Meyer's introductions.)

Ribes spp. (Grossulariaceae.) 39910, 39916. Cuttings of a currant and a gooseberry from Kansu, China. 39910, "a

Wild Rugged Mountain Country in Kansu Province, China.

On the steep rocky slopes of this region at elevations of over 4000 feet Potanin's drought resistant wild peach (*Prunus persica potanini*, S. P. I. Nos. 39899, 40007, 40008, 40009) occurs in company with Loniceras, *Philadelphus* spp., Viburnums, *Hippophae salicifolia*, etc. Photograph No. 13092, by Frank N. Meyer, near Pao dji, China, Nov. 9, 1914.



Potanin's Wild Peach of the Kansu Province of China (*Prunus persica potanini*).

This is called the "Mao tao" or hairy peach and belongs to the same general type as *Amygdalus davidiana* but may withstand even greater heat and prove of value as a stock in the arid west (S.P.I. Nos. 39899, 40007, 40008, 40009). Natural size photograph No. 13091 by Frank N. Meyer, Lan Tsai, Kansu, China, Nov. 3, 1914.

currant of very vigorous growth, collected on a sheltered mountain side at an elevation of over 7000 feet. The shrubs are of open growth and reach a height of 25 feet. Of value possibly for hybridization purposes." 39916, "a wild gooseberry, growing from 6 to 15 feet tall, found in dry loess embankments at elevations from 7000 to over 9000 feet. Remarkably spiny; berries medium large, of elongated shape and persisting throughout the greater part of the winter. These gooseberry fruits are preserved by the American missionaries at Kiu cheng and they supply a very delicious tart compote. Of value apparently as a fruiting shrub and as a hedge plant for the cold semi-arid sections of the United States." (Frank N. Meyer's introductions and descriptions.)

Salix spp. (Salicaceae.) 39921-922. Cuttings of willows from Lien Hua shan, Kansu, China. 39921, "a remarkable variety of willow, growing into a tall shrub or a bushy small tree and of which the tops for the length of about one foot are of a bright yellow color. When seen from above on a sunny winter day they make a strikingly cheerful impression. Of special value for parks when planted in masses or in groups in glens or in low-lying places, so that they can be viewed from above. Collected at an elevation of 9000 feet. Proposed name Golden Top Willow. Where these Golden top willows grow one also finds deep blue spruces, snowy white birches, and red-wooded dogwoods. These together with the purplish crags as a background, make a most wonderfully harmonious winter landscape." 39922, "a variety of the Golden top willow, but with the young twigs of a rich reddish-brown color." (Frank N. Meyer's introductions and descriptions.)

Tamarix aphylla (L.) Karsten. (Tamaricaceae.) 39856. Cuttings of a tamarisk from Cairo, Egypt. Presented by Mr. Thomas W. Brown, Director, Horticultural Division, Ministry of Agriculture. "This is by far the best of the Egyptian species for cultivation as a timber tree on desert land. We have employed it largely as a wind- and sand-break at the Sewage Farm at Khanka, which is situated on what was unreclaimed desert land. The cuttings were planted along shallow water channels, containing in one case chlorine equivalent to sodium chloride to the extent of 1272 parts per million and in another case to the extent of 2028 parts per million. *Tamarix aphylla* very rarely produces seed here." (Brown.)

Viburnum furcatum Blume. (Caprifoliaceae.) 39998. Seeds from Japan, received through the Arnold Arboretum, from

the collections of Mr. E. H. Wilson. "This has the showy sterile marginal flowers, but its stems are more uniformly erect (than *V. alnifolium*.) It differs also in the shorter stamens, which are only half the length of the corolla, and in the shape of the furrow in the seed. It succeeds in gardens no better than *V. alnifolium*, although there was a healthy plant at Abbotsbury, near Weymouth, a few years ago. It is a native of northern Japan at low levels, and of the mountainous parts of the south. The foliage turns brilliant scarlet to reddish purple in autumn. It is a bush twelve feet or more high in a wild state." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 642.)

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
Allen M. Groves, Nathan Menderson, and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Issued July 21, 1915.

PROPERTY OF DIVISION OF
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 107. March 1915.

Genera Represented in This Number.

Amygdalus	40001-005	Polygonum	40034
Castanea	40035-036	Prunus	40012-015
Cephalotaxus	40017-018		40067
Diospyros	40024	Pyrus	40019
Garcinia	40103	Schizandra	40025
Grevillea	40041-046	Stylidium	40032
Hakea	40047-053	Telopea	40064
Osteomeles	40033	Trachycarpus	40029

Plates:

The Pekin Pear or Pai li.
Dated Stems of the Edible Bamboo.
A Collection of Nuts and Dried Fruits Presented by the Ameer of Afghanistan.
A Group of African Oil Palms in Bahia.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Amygdalus sp. (Amygdalaceae.) 40001-40005. Seeds of wild peaches from Shensi and Kansu, China. 40001. "Wild peaches having larger fruits than the ordinary wild ones, said to come from near Tze Wu, to the south of Sianfu, but some also probably collected from trees in gardens which were raised from wild seeds. When seen wild this peach generally assumes a low bush form of spreading habit; when planted in gardens and attended to, it grows up into a small tree, reaching a height of 12 to 20 feet, with a smooth trunk of dark mahogany-brown color. The leaves are always much smaller and more slender than in cultivated varieties, while their color is much darker green. They seem to be somewhat less subject to various diseases than the cultivated sorts and they are most prolific bearers, although the fruit is of very little value on account of its smallness and lack of flavor. In gardens around Sianfu this wild peach is utilized as a stock for improved varieties. It is also grown as an ornamental; said to be literally covered in spring with multitudes of shell-pink flowers." 40002. "Wild peaches, occurring in the foothills of the higher mountains at Tsing Ling Kang, Shensi, at altitudes from 2000 to 5000 feet, generally found at the edges of loess cliffs and on rocky slopes. There is a great deal of variation to be observed as regards size and shape of leaves, density of foliage and general habits." 40003. "Wild peaches found on a mountain side, near Pai dja dien, Shensi, at an elevation of 4000 feet; these small trees and bushes had borne such a heavy crop that the ground beneath them was covered with a layer, a few inches thick, of the small, yellowish, hairy fruits. The local inhabitants didn't consider them worth collecting even, and they were rotting and drying up." 40004. "Wild peaches occurring as tall shrubs in loess cliffs, at the Tibetan frontier, Kagoba, Kansu, at elevations of 6000-8000 feet. Save for some children who eat these wild peaches, they are otherwise considered worthless wild fruit. Local name *Yeh t'ao*, meaning 'wild peach,' and *Mao t'ao*, meaning 'hairy peach.'" 40005. "Wild peaches found on stony mountain slopes in a wild, very sparsely populated country, near Kwa tsa, on Siku River, Kansu. No fruit trees whatsoever are cultivated by the local settlers in the mountains, and the way some o these peach bushes grow excludes them from ever having been brought there by any man or even any quadruped; only birds might have transported them." (Meyer's introductions.)

Castanea spp. (Fagaceae.) 40035-036. Seeds of chestnuts from Hui hsien, and Cheng hsien, Kansu, China. "A species

of chestnut of medium tall growth; trunk more slender, and bark smoother, than in *C. mollissima*, while the leaves, burrs and nuts are smaller. Loves apparently shady situations and damp soil. Of value as a nut-bearing tree, especially for the southeast United States. Where these chestnuts grow in gardens one also finds some of the following trees, showing how mild the climate is: *Ligustrum lucidum*, *Chamaerops excelsa*, *Hovenia dulcis*, *Diospyros kaki*, *Punica granatum*, *Phyllostachys bambusoides* (*P. quilioi*), etc." (Meyer's introductions and descriptions.)

Cephalotaxus sp. (Taxaceae.) 40017-018. Seeds from near Kwan yin tang, Shensi, and from near Kwa tsa, Kansu. "An evergreen conifer, growing into a tall shrub or rarely into a gnarled small tree. Resembles in general habit *Cephalotaxus fortunei*, but of denser, less open growth, especially beautiful when young, or two or three years after it has been cut to the ground; for this plant throws up sets of new shoots more compact in growth than the original stems. It withstands a great amount of shade and thrives even among bowlders and stony debris. Of value as an ornamental evergreen, especially for shady places, for those parts of the United States where the winters are not too severe. Collected at an elevation of 4000 feet (and 40018 at 5000 feet). Locally this shrub is called *Sui pei shu*, meaning 'water conifer.' Its seeds are collected by the people and eaten boiled, apparently to remove a poisonous principle. They are rich in oil, but taste bitterish even after having been boiled." (Meyer's introductions and descriptions.)

Diospyros lotus L. (Ebenaceae.) 40024. Seeds of a persimmon from Siku, Kansu, China. "A variety of *Ghoorma* persimmon, with much larger fruits than the ordinary sort; shape also different, being flattened-globose; color yellow, changing later on to blackish. Taste much like a *kaki*, making one think that *D. lotus* possibly could be developed into a promising fruit-bearing tree fit especially for mild-wintered and semi-arid regions." (Meyer's introduction and description.)

Garcinia tinctoria (DC.) W. F. Wight. (Clusiaceae.) 40103. Seeds from Ootacamund, India. Presented by Mr. F. H. Butcher, Curator, Botanic Garden and Parks. "A symmetrical cone-shaped bushy tree, growing to 25 or 30 feet high, native of South India and Malaya. It bears large leathery leaves, 12-16 inches long, and two and one-half to three and one-half inches in width. The handsome yellow fruit produced in great abundance in December and January, is of

the form and size of a small orange, usually with a pointed projection at the end, the thin tender skin being smooth and polished. The yellow juicy pulp is of an acid but refreshing taste. The tree is propagated by the large seeds, and thrives up to about 3000 feet or more." (Macmillan, Handbook of Tropical Gardening and Planting.)

Grevillea spp. (Proteaceae.) 40041-046. Seeds of six varieties and species of ornamental shrubs and trees with white or red flowers in racemes, from Sydney, New South Wales. Presented by Mr. J. H. Maiden, Director of the Botanic Gardens. Among the species represented are *G. caleyi*, *G. hilliana*, *G. laurifolia*, *G. triternata* and two varieties of *G. banksii*. *G. robusta* has succeeded so well in Florida as a street and lawn tree and as a florists' plant that other species should receive careful cultivation also.

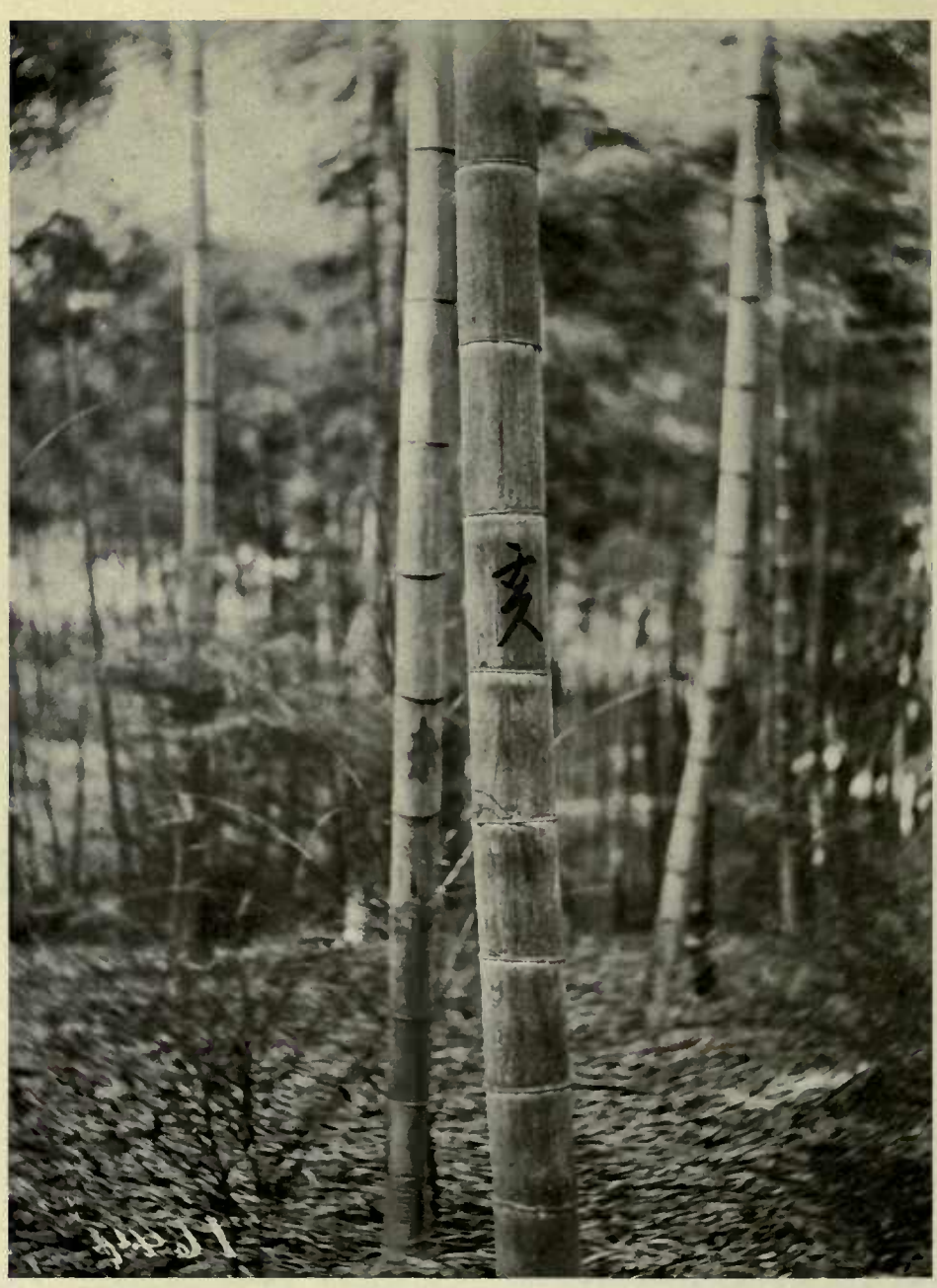
Hakea spp. (Proteaceae.) 40047-053. Seven species from Sydney, New South Wales. Presented by Mr. J. H. Maiden, Director of the Botanic Garden. A considerable number of species of this genus are used for outdoor planting in California, especially where shrubs are desired to stand hard usage, such as around railway stations, etc.

Osteomeles schwerinae Schneider. (Malaceae.) 40033. Seeds from Kwa tsa, Kansu, China. "A very dense-growing shrub, from two to five feet tall, having small, dark-green, finely pinnate leaves. Found on dry stony wastes and in rock cliffs. Bears small bluish-black berries in the late fall of the year and said to bloom profusely in early summer with conspicuous white flowers. Of value as a shrub for rockeries and as a lining bush along pathways running irregularly." (F. N. Meyer's introduction and description.)

Polygonum sp. (Polygonaceae.) 40034. Seeds from T'ung T'ung, Kansu, China. "A Polygonum of slender woody growth, a vine, found on open places here and there, covering often whole blocks of scrub or rocky cliffs with its masses of snowy white flowers, which appear in late summer and are produced in the greatest profusion. Foliage relatively small and resembling leaves of buckwheat. Able apparently to withstand much drought and adverse conditions. Of decided value as a porch, arbor, pergola and trellis vine for the greater part of the United States. Collected at an elevation of 5000 feet." (F. N. Meyer's introduction and description.)

The Pekin Pear or Pai li (White Pear).

Both the Keiffer and LeConte varieties of pear which are extensively grown in America have shown a fair degree of immunity to the pear blight, a very destructive bacterial disease. These varieties are believed to be crosses between varieties of the Chinese pear (*Pyrus chinensis*) and the European pear (*Pyrus communis*). Unfortunately, neither the Keiffer nor the LeConte is of high quality, having inherited a certain coarseness from the Chinese parent. The introduction of the *Pai li* or white pear of Pekin, considered the finest variety in North China, will probably interest the pear breeders and may lead to the production of better flavored blight-resistant pears. Photo No. 13030 by Frank N. Meyer, Oct. 18, 1913, Pekin, China.



DATED STEMS OF THE EDIBLE BAMBOO.

In Japan the edible bamboo (*Phyllostachys mitis*), is grown in large groves and the young shoots are marketed as asparagus is sold in America. The stems are dated in ink with the character for the year of their birth, and four years later they are cut for timber. Small groves of this species are now established in Louisiana. Photo No. 1644 by David Fairchild, Kyoto, Japan, 1902.

Prunus armeniaca L. (Amygdalaceae.) 40012-013. Seeds of wild apricots, from near Lan Tsai, and Kwa Tsa, Kansu, China. "Wild apricots occur very commonly in the mountains at altitudes from 5000 to 9000 feet. The natives collect the stones, crack them, take the kernels out and eat them, after having boiled them. They still taste bitter, however. Of use possibly in extending apricot culture farther north; also as stocks for stone fruits in semi-arid regions and as hardy spring-flowering park trees for the cooler parts of the United States." (F. N. Meyer's introductions and descriptions.)

Prunus spp. (Amygdalaceae.) 40014-015. Seeds of wild plums from near Kwan yin tang, Shensi, and Kagoba, China. 40014, "a wild plum, found on somewhat stony mountain slopes at elevations between 4000 and 5000 feet. Grows up into a tall bush, densely branched, and often spiny on the young shoots. Fruits the size of a large marble, of yellowish green color, flavor very spicy, although sour near the skin and the stone. Of value possibly to supply compotes and for breeding purposes." 40015, "a wild plum growing into a tall bush or even a small tree, found on sloping stretches of loess land at the foot of mountains near the Tibetan frontier at elevations of from 6000-8000 feet." (F. N. Meyer's introductions and descriptions.)

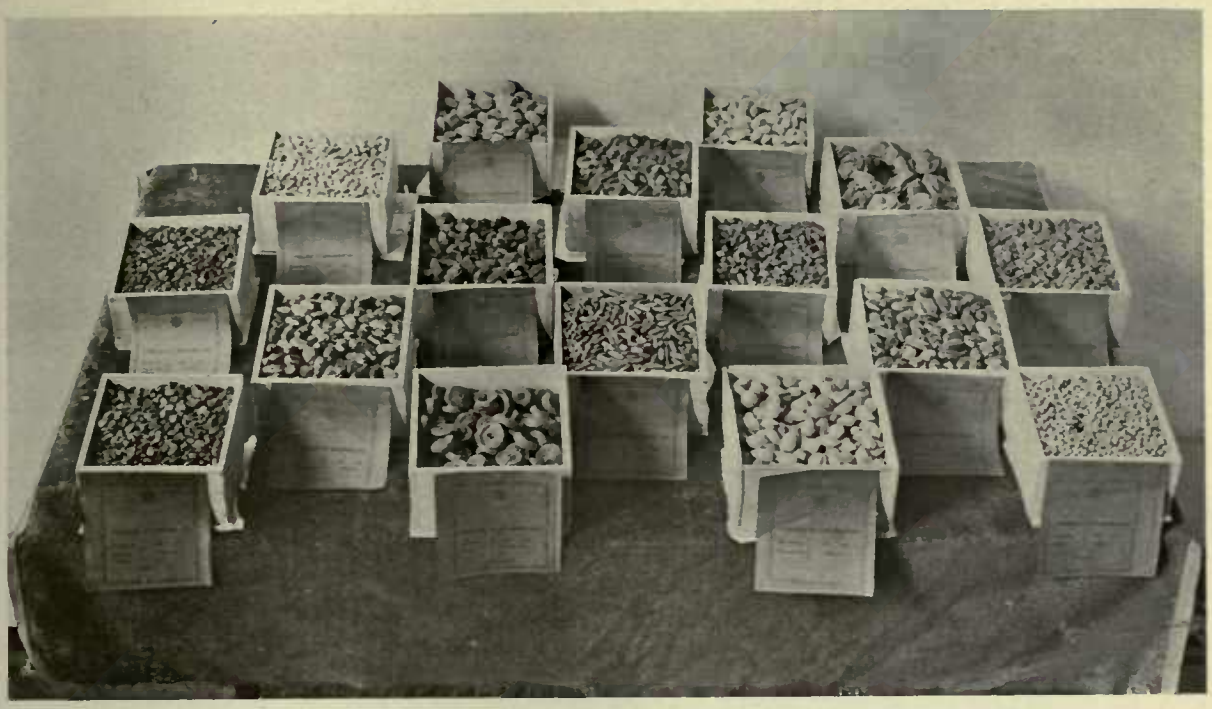
Pyrus sp. (Malaceae.) 40019. Seeds of a wild pear from near Tchen ya tan, Kansu, China. "A species of wild pear, growing to be a large tree, with a wide-spreading, dense head of branches. Bark of dark color and in the main trunk even blackish and deeply furrowed in old specimens. Young branches often fiercely spiny and especially so in suckers. Leaves small and with much shorter petioles than in *Pyrus chinensis*. Fruits globose, flattened. Calyx persistent, peduncle generally short; much variation exists as regards size, but the fruits of this species of pear are generally small; the flesh is also acrid and often quite hard, though some of the larger ones are edible after having been frozen. This pear is not found in the warm valleys, but it thrives best at elevations of about 8000 feet, in company with such hardy trees and shrubs as *Picea obovata*, *Populus tremula*, *Malus baccata*, *Hippophae rhamnoides*, *Syringa amurensis*, *Rhamnus dahurica*, *Sorbaria sorbifolia*, and others. This pear has apparently given rise to some locally cultivated forms bearing small, sour fruits, which are juicy, however, and melting, and not hard and gritty like the poorer strains of *P. chinensis*. Of undoubted value as a stock for pears in cold sections and as a factor in breeding experiments in trying to extend successful pear

culture farther northward." (F. N. Meyer's introduction and description.)

Schizandra chinensis (Turcz.) Baillon. (Magnoliaceae.) 40025. Seeds from Paoki, Shensi, China. "A perennial woody vine of slender growth, found in between tall scrub on shady places; foliage not unlike that of *Actinidia kolomikta*, but somewhat thinner and with red petioles. The carmine-red berries are borne in small spikes on fleshy stalks and they hang down gracefully; these berries are the size of currants; they possess a sub-acid, spicy, aromatic taste, but this last is somewhat too pronounced to make it acceptable right away to the majority of Caucasian people. The Chinese eat them much and claim they purify the blood and dislodge waste matter from the body. By selection better varieties could be obtained, no doubt, which might prove to be quite acceptable to the western palate. This vine deserves to be experimented with for the following purposes: as an ornamental cover vine for shady places, as a possible new fruiting vine to be grown on trellises on northern exposures, and as medicinal plant having apparently some value as a blood cleanser. Chinese name *Wu wei tzu*, meaning 'fruit of five tastes.'" (F. N. Meyer's introduction and description.)

Stylidium sp. (Cornaceae.) 40032. Seeds from near Yu yin chen, Kansu, China. "A shrub or small tree, bearing leaves of many forms, some being very large and of lopsided, elliptical shape, while others have five points and are small, resembling leaves of *Liquidambar styraciflua*. Found in somewhat damp places at the foot of embankments or along streams. Of value as a striking looking garden and park shrub for mild-wintered regions." (F. N. Meyer's introduction and description.)

Telopea speciossima (Smith) R. Brown. (Proteaceae.) 40064. Seeds of the waratah from the Botanic Gardens, Sydney, New South Wales. Presented by the Director, Mr. J. H. Maiden. "Although this beautiful and very uncommon evergreen shrub was introduced from the Blue Mountains of New South Wales as long ago as 1789, it has very rarely been seen in flower in England. The deep crimson, tubular flowers are about one inch long, and are borne in a dense globular head surrounded by an involucre of ovate-lanceolate blood-red bracts, each measuring from two to three inches in length. The firm leathery leaves are cuneate-oblong in shape, and measure about 6 inches long by one and one-half inch broad. They are toothed in the upper part, and are



A Collection of Nuts and Dried Fruits Presented by the Ameer of Afghanistan.

His Majesty, Habibullah Khán, sent the above collection through his special representative, Mr. A. C. Jewett, who brought it as baggage and delivered it in person to the Department. For each sample he had prepared special lithographed labels, giving the correct name of the fruit and the locality from which it came. As the winters in Kabul, the capital of Afghanistan, are bleak, cold and dry, the fruits grown there should prove hardy in our Middle States. Among the most interesting of the collection are the excellent apricots, raisins, Elaeagnus fruits, and dried white mulberries. The latter form almost the exclusive food of hundreds of thousands of Afghans for many months of the year. This use of dried mulberries suggests a new tree food crop. Analyses of these dried mulberries show their high food values.

Group of African Oil Palms in Bahia.

The Oil or Dende Palm as it is called in Southern Brazil is believed to have been introduced from Africa in the early days of the slave trade and it has become perfectly acclimatized there. In West Africa its nuts which are borne in large crowded bunches form an important article of export, special steamship lines having been organized to carry them to Hamburgh. In Brazil the oil is used extensively for table purposes quite as we use olive oil. Photo No. 15408 taken Dec. 26, 1913, by Dorsett, Shamel and Popenoe at Bahia, Brazil.

dark green above and paler below." (Proc. Royal Hort. Soc., vo l. 40, p. cx xx, 19 15).

Trachycarpus excelsus (Thunb.) Wendl. (Phoenicaceae.) 40029. Seeds of a palm from Huihsien, Kansu, China. "The Chinese fan or coir palm, cultivated in gardens in south Shensi and south Kansu as an ornamental tree, reaching a height of thirty to forty feet. Withstands successfully winter temperatures, unprotected, of -12° C. (+11° F.), as happened in Huihsien on November 1, 1895, when all the other palms around there died. Of value as a fine ornamental garden and park tree for all such parts of the United States where the mercury does not go much below 10° F. Chinese name *Tsung shu*, meaning 'coir palm tree.' Obtained from the garden of the Belgian Roman Catholic missionaries." (F. N. Meyer's introduction and description.)

NOTES FROM CORRESPONDENTS ABROAD.

Peru. Ollantaytambo. Mr. O. F. Cook writes, May 6, 1915. "We took a good look at the alpine crops two weeks ago, but decided that none would be suited for turning loose in quantity without previous handling by us, except possibly the quinoa, which may turn out to be really desirable. But that is a seed crop and can be handled easily. It is being harvested now and will be ready by the time we go home. Another kind of Chenopodium and an Amaranthus are also cultivated as seed crops. The very extensive use of the broad bean as a high altitude crop leads me to repeat what I have said so many times, that we should know much more than we do about this and the chick pea. The later is not important here and does not go nearly as high.

"The climate here at 9000 feet is very salubrious and we are feeling very well. As a place to study primitive agriculture and the remains of the ancient system, no better location could be imagined. After all that has been said by Markham and others the nature and extent of the ancient agriculture is still very little appreciated. Some features, at least, we shall be able to present if our pictures come out well.

"As yet we have not been down into the eastern tropical valleys, though we have seen some interesting cotton samples from there."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
Allen M. Groves, Nathan Menderson, and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Issued July 21, 1915.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorer's and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 108. **April 1915.**

Genera Represented in This Number.

Berberis	40562	Lonicera	40585
Camoensia	40391	Olea	40396-405
Castanea	40508	Olearia	40586
Chalcas	40392	Piptanthus	40589
Clematis	40570	Prunus	40504
Cotoneaster	40574-579	Pyrus	40497
Crataegus	40605	Ribes	40406-496
Deutzia	40580	Rubus	40594
Eragrostis	40535	Ulmus	40507
Ficus	40499	Ziziphus	40506
Garcinia	40553		

Plates:

A Chinese Fruit Stand, Loaded with Choice Fruits.
A Small-Fruited Chinese Haw Tree.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Berberis brachypoda Maxim.(Berberidaceae.)40562. Plants of a barberry from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "A yellow-flowered scarlet-fruited barberry, related to *B. amurensis*, from Central and Western China. A shrub up to six feet in height with elliptic-oblong, acute leaves, pubescent on both sides, one and one-half to three and one-half inches long, racemes pubescent, slender, two to three inches long, fruits elliptic, up to 11 mm. long and 6 mm. across, with a sessile stigma." (Sargent, Plantae Wilsonianae, and Bailey, New Standard Cyclopedia.)

Camoensia maxima Welw. (Fabaceae.) 40391. Seeds from Loanda, Angola, Portuguese West Africa. "This climbing legume is suited for large greenhouses only or for tropical landscapes. It flowered at the Department greenhouses from October to December 1907. The plant is native to tropical West Africa, and was reported by Welwitsch, its discoverer, as adorning lofty trees in the outskirts of forests of the Golunga Alto 'with its splendid bunches of pendulous flowers, tinged with gold on the edge of the petals.' The flowers are borne in racemes of sometimes nearly a dozen and are probably the largest of all leguminous flowers. The individual flowers are as much as eight inches in length and the petals of a ghostly white, margined with old gold. The standard is about four inches in width, while the other petals are quite slender. When first opening the flowers have a delicious fragrance." (R. A. Young.)

Castanea mollissima Blume? (Fagaceae.) 40508. Seeds of a chestnut from Sianfu, Shensi, China. "A large-fruited variety of Chinese chestnut, coming from Ya tze ko, south of Sianfu, called *qui li tze*, meaning 'superior chestnut.' This variety is propagated by grafting. It seems on the whole somewhat more resistant to the bark disease (*Endothia parasitica*) than the ordinary strain of Chinese chestnut." (Meyer's introduction and description.) It is interesting to note in this connection that a tree raised from seed of S.P.I. 21875 introduced by Mr. Meyer from Pangshan as *Castanea sativa* but since determined as *Castanea mollissima* Blume, which was planted out in my garden in 1908, was inoculated by Mr. J. F. Collins of the Bureau of Plant Industry, Sept. 13, 1912. For a long time it showed no signs of the disease, but later developed a very mild form of it which was left on the tree until June 1st, 1913, when it was cut out. Notwithstanding the exposure to the disease which the inoculation and the long presence of the

disease on one of the main branches of the tree imposed, it was examined on July 16, 1915, by Dr. C. L. Shear of this Bureau and pronounced entirely free from the disease. It is now at eight years from seed bearing a few fruits. (Fairchild).

Chalcas exotica(L.)Millspaugh.(Rutaceae.) 40392. Seeds of the orange jessamine from the Hongkong Botanical Garden. Presented by Mr. W. J. Tutcher, Superintendent, Botanical and Forestry Department. "The orange jessamine is commonly grown in greenhouses on account of its abundant and very fragrant flowers. These are often to be seen along with the mature red fruits, which makes a striking contrast with the panicles of white flowers and delicate foliage. The root-growth of this species is remarkably vigorous under greenhouse conditions. Lemons can be budded on it, and make a rapid growth. It is being tested as a stock for the common citrus fruits in situations in which a vigorous root system is desired." (Swingle, in Bailey, Standard Cyclopedia of Horticulture). In south Florida it makes a beautiful evergreen bush especially well adapted for use in formal gardens.

Clematis tangutica(Maxim.)Korsh.(Ranunculaceae.) 40570. Plants of a clematis from the Hon. Vicary Gibbs, Elstree, Herts, England. "A species closely allied to, or perhaps a variety of *C. orientalis*, growing eight to ten feet high; stems slightly downy. Leaves grey-green, like those of *C. orientalis*, but downy when young; leaflets raggedly toothed, and sometimes two or three lobed. Flowers rich yellow, solitary, on downy stalks three to six inches long; sepals nearly two inches long, narrowly ovate, long and slenderly pointed, downy outside and at the edges. Seed-vessels crowned with long-feathered styles. Native of central Asia, introduced to Kew from St. Petersburg in 1898. It is the handsomest yellow-flowered clematis in cultivation, the finest flowers being about four inches across. It differs from *C. orientalis* in the larger flowers, and in the downy stems, flower-stalks, etc. It is a superior plant." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 367.) Specimens have flowered at Compton, in the arboretum of Mr. John T. Morris, Chestnut Hill, Pennsylvania.

Cotoneaster sp.(Malaceae.)40574-579. Plants of six species of cotoneasters from the Hon. Vicary Gibbs, Elstree, Herts, England. Among these are a number of the new Chi-

nese species and varieties discovered by Mr. E. H. Wilson in central and western China, some of them recommended for the graceful habit of their growth, and others for the beauty of their fruit.

Crataegus pinnatifida. (Malaceae.) 40605. Seeds of the large-fruited Chinese haw from Chefoo, China. Presented by Mr. A. Sugden. "*Suan tza*. The fruit of this hawthorn is about as big as a damson, and to my mind excellent as a stewed fruit or as a 'cheese'. To cook, simmer in hot water for a few minutes till soft enough to pull the skin off with the fingers; if cut off with a knife they say much of the coloring matter is lost; our cook then pokes the stones out through the top with a chop stick; they are then stewed for a few minutes with lots of sugar; the rough way of cooking is to cut in half to remove stones and not to peel. They look nicer the other way and the skin does not improve them for eating." (Sugden.)

Deutzia schneideriana laxiflora Rehder. (Saxifragaceae.) 40580. Plant of a deutzia presented by the Hon. Vicary Gibbs, Elstree, Herts, England. "A shrub from western Hupeh, China, from two to two and a half meters high. Similar to *D. scabra*, but the panicles looser and more graceful." (Rehder.)

Eragrostis abyssinica (Jacq.) Schrad. (Poaceae.) 40535. Seeds of teff from Johannesburg, Union of South Africa. Presented by Mr. J. Burtt-Davy. "For trial as a hay-grass in Florida and other parts of the southeast. Teff continues to be a standard hay crop here and in spite of the fact that it has now been established in South Africa for several years, prices of teff hay on the Johannesburg market have again been ruling up to four pounds ten and five pounds per ton. It is remarkable how well stock do on this grass, and the way in which its use has spread without any artificial boom proves clearly that it is a first-class thing." (Burtt-Davy.)

Ficus carica L. (Moraceae.) 40499. Cuttings of a fig from Boscotrecase near Naples, Italy. Presented by Dr. Gustav Eisen. "*Trojaro*. This fig requires a much warmer climate, at least a more even climate than that of Fresno, and I think should not be recommended to any locality north of Los Angeles. Where it does well it is a superior variety, preferable to the White Adriatic. It is the best table fig in Italy. Around San Francisco Bay, this fig never matures. It is not affected by fall rains, like the

Adriatic and most other figs, and possesses advantages not found in any other fig ripening at the same time, September-October. I have not seen the fruit from this tree, but as they were growing in the garden of a friend of mine, I have no doubt but that his statement that the fruit was the very best was true." (Eisen.)

Garcinia loureiri Pierre.(Clusiaceae.)40553. Seeds from the Botanic Garden, Buitenzorg, Java. Presented by the Director. "*Bua nha.* A tree forty to sixty feet high with opposite branches and coriaceous, nearly oblong leaves, three to six inches long. The younger branches are nearly square but soon become cylindrical. Flowers inconspicuous. Fruit ovoid, one and one-half inches long. acidulous, edible. Cultivated throughout the provinces of lower Cochin-China and Cambodia." (Pierre, Flore Forestiere de la Cochin-Chine.)

Lonicera henryi Hemsley.(Caprifoliaceae.)40585. Plant of a honeysuckle from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "An evergreen climber with slender, very downy young shoots. Leaves oblong, with a lance-shaped apex, and a rounded or heart-shaped base, one and one-half to four inches long, three-fourths to one and one-half inches wide, dark green above, paler and rather glossy beneath, downy on the midrib and margins. Flowers purplish red, produced during June at the end of the shoot in a cluster two or three inches across; each stalk is twin-flowered. Fruit blackish-purple. Native of China and Thibet, introduced by Wilson in 1908. It is a free-growing climber of the same character as *L. japonica*, which is however very distinct in the big leaf-like bracts." (W. J. Bean, Trees and Shrubs Hardy in the British Isles.)

Olea europea L.(Oleaceae.)40396-405. Cuttings of olives from Tunis. Presented by Mr. Bernard G. Johnson. "At Biskra, olives are hardly ever planted from cuttings, but spring up fortuitously from seeds and are then grafted or budded. At least at the Chateau Landon, I was shown the young trees, that had been budded to Zoragi. I have seen numerous old trees where suckers had been permitted to grow to some size, such are called Zaboosh." Among the varieties are "the *Tefahi* (meaning apple), which is the largest fruited of the olives grown at Biskra, but a light bearer;" the *Zoragi*, which seems to be the most common at Biskra, probably 80% or more of all the trees belonging to it; it is a heavy bearer and the fruit is quite large,

though smaller than *Tefahi*; it is used for oil and pickling; Prof. Trabut says 'the oil of *Zoragi* is very thick and heavy and not much appreciated by the natives;' this fault can however, be remedied by mixing with a lighter oil; the *Tunisiya*, which grows more slender and taller with lighter trunk; the fruit is smaller, and makes a better oil but a much inferior producer; the *Boo Shookiya*, the fruit of which is not so round as *Tefahi* or *Zoragi*, but more oval and has a separate formation at one end resembling a spine, whence its name (meaning producer of spines).' (Johnson.)

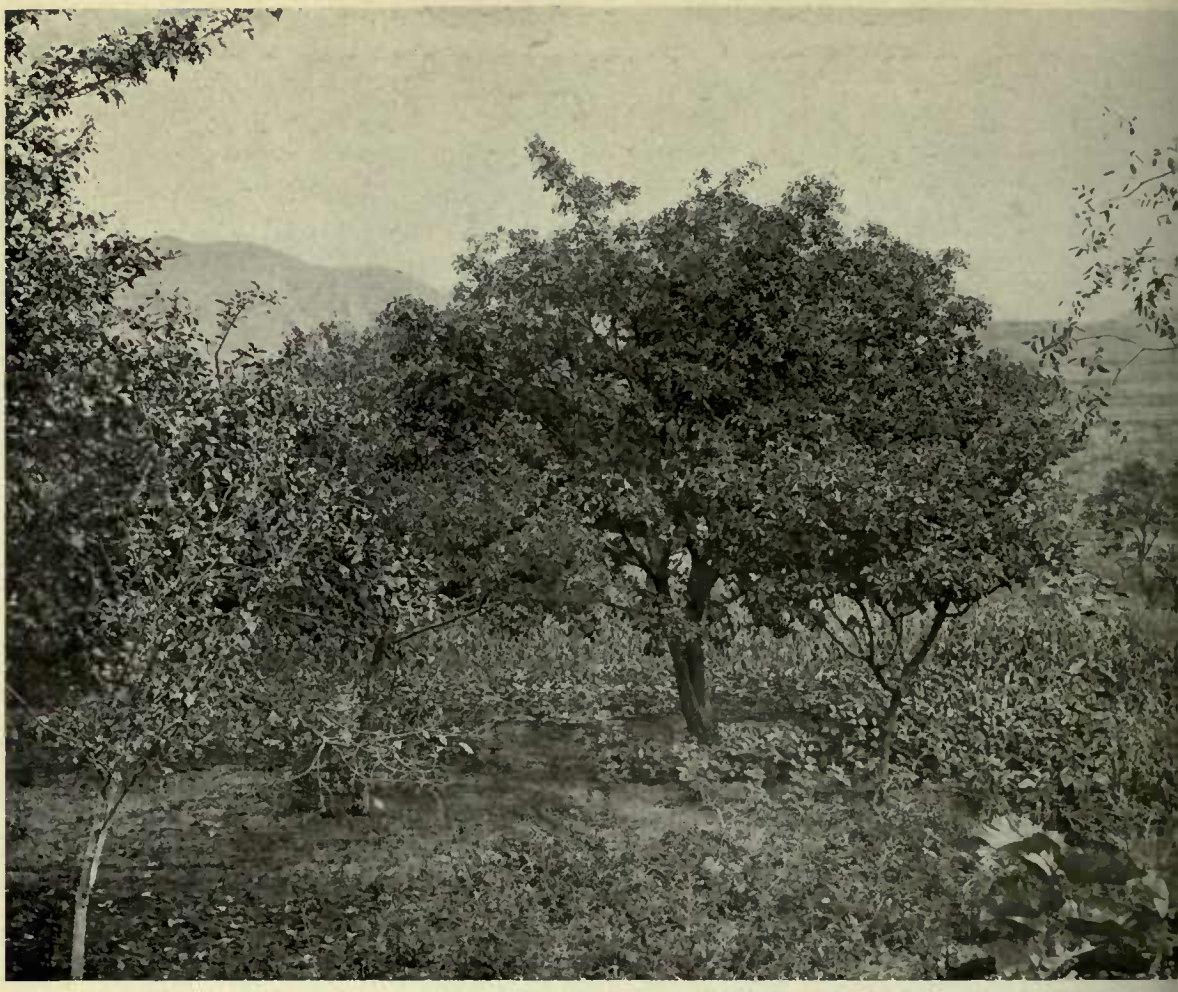
Olearia traversii (Muell.) Hook. f. (Asteraceae.) 40586. Plants from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "*Akeake*. A tree twenty to thirty feet high and sometimes two feet in diameter. This may be considered as the only valuable timber tree in the Chatham Islands, being durable and not subject to attacks of insects." (Buchanan. Trans. Proc. N. Z. Inst., vol. 7, p. 337.)

Piptanthus nepalensis (Hook.) Sweet. (Fabaceae.) 40589. Plant from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "A shrub or low tree with very pithy young shoots, naturally eight to twelve feet high, but growing taller against walls. In Kew it is deciduous, but in milder climates it retains more or less foliage during the winter. Leaves alternate, of three lanceolate stalkless leaflets, three to six inches long, about one-third as wide, smooth except when quite young, dark green above glabrous beneath, the common leafstalk one and one-half to two inches long. Racemes stiff, erect, two to three inches long, and as much broad, hairy, set with hair bracts. Flowers pea-shaped, one and one-half inches long the stalk up to one inch long and like the brown calyx very hairy; petals bright yellow. Pod three to five inches long, three-fourths inch wide. Native of the Himalaya, introduced to England in 1821. It thrives well against a wall where it flowers in May, but is not permanently hardy in the open air at Kew. A shrub of exceptionally vigorous appearance. It is nevertheless not long lived. It is easily propagated by seeds, which it ripens in quantity, and owing to its dislike of root disturbance should be grown in pots until planted in permanence. It flowering sprays resemble those of the herbaceous genus Thermopsis." (W. J. Bean, Trees and Shrubs Hardy in the British Isles.)

Prunus sibirica L. (Amygdalaceae.) 40504. Seeds of the Siberian apricot from Novospasskoe, Russia. Presented by

A CHINESE FRUIT STAND, LOADED WITH CHOICE FRUITS.

It is at such fruit stands as this that Mr. Meyer gets positive information of the existence of valuable varieties of Chinese fruits which he is later able to get budwood of for introduction into this country. Note the beautiful Tamopan persimmons at the right and the fine Chinese pears in the foreground. Photo No. 5959 by F. N. Meyer, taken Oct. 18, 1913 at Pekin, China.



A SMALL FRUITED CHINESE HAW TREE.

The small fruited haws of China (*Crataegus pinnatifida*) are more acid than the large varieties and they are an excellent substitute for cranberries. The American missionaries throughout this Province use them as such. They could be grown for that purpose in the United States so that everyone could have his cranberry tree in his yard. Photo. No. 5332 by F. N. Meyer, taken August 23, 1907, at Cheesan, Shantung, China.

Mr. A. Woeikoff, Director, Experimental Garden of the Cholmy School of Horticulture. "A deciduous bush or small tree; leaves ovate, the apex long drawn-out, two to three and one half inches long, half as wide, reddish at first, then bright green and smooth above with axil tufts of down beneath; stalk one-half to one inch long. Flowers mostly solitary, white or pink. Fruits scarcely stalked, about one inch long, yellow except on the sunny side, covered with a velvety skin; the flesh scanty, dry, harsh and scarcely edible; kernel of nut with an almond-like, bitter taste. Native of the mountains of southern Siberia, where, according to Pallas, the Russian botanist, some mountain-sides are covered with its pink blossoms in May, when the northern sides are purple with *Rhododendron dauricum*. Although an old tree in gardens(it was cultivated at Kew one hundred years ago), and still offered for sale by continental dealers, it is scarcely known in England nowadays. So far as I have seen, it has very little to recommend it for gardens, being of about the same value as the wild apricot, to which it is very closely allied. Its leaves have usually much more elongated points." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol.2,p.253.)

Pyrus salicifolia Pallas.(Malaceae.) 40497. Seeds of the willow-leaved pear from Novospasskoe, Russia. Presented by Mr. A. Woeikoff, Director, Experimental Garden of the Cholmy School of Horticulture. "A tree 15 to 25 feet high, branchlets covered with down which is quite white when young. Leaves 1½ to 3½ inches long, 1/3 to 2/3 inches wide, narrowly lanceolate, tapering gradually towards both ends, covered when young on both sides with a beautiful silvery grey down; later in the year this falls away from the upper surface, leaving it shining green; margins quite entire; stalk one-half inch long or less, sometimes scarcely noticeable. Flowers pure white, about three-fourths inch across, produced in April, closely packed in small rounded corymbs, the calyx and flower-stalk covered with white wool. Fruit of the typical pear-shape, one to 1¼ inches long and wide. Native of southeastern Europe and Asia Minor. It is much the most ornamental of all true pears. Its leaves and flowers often open simultaneously, and it then presents a very charming picture, the willow-like leaves being of a conspicuous silky white. After the flowers fade, the leaves remain silvery for some weeks, gradually, however, becoming greener on the upper surface. The fruit is harsh to the palate and of no value." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol.2, p. 292-293.)

Ribes spp. (Grossulariaceae.) 40406-496. Cuttings of ninety-one species of gooseberries and currants from the Fruticetum Vilmorinianum, Les Barres, Nogent-sur-Vernisson, Loiret, France. Purchased from M. Maurice Vilmorin. This long series of Ribes was introduced for the work of the Office of Pomological and Horticultural Investigations in breeding disease-resistant strains of these fruits.

Rubus giraldianus Focke.(Rosaceae.) 40594. Plant of a bramble from Elstree, Herts, England. Presented by the Hon. Vicary Gibbs. "A vigorous, deciduous shrub up to 8 or 10 feet high. Inflorescence a terminal panicle, the flowers small and of little beauty, purple, fruit black. Native of China, first found in the province of Shensi by Giraldi, later in Szechuen by Wilson, who introduced it in 1907. Its claims to recognition in the garden are its remarkably white stems, which are as striking in this respect as those of *R. biflorus*, and its pendulous branches, which give a remarkable fountain-like aspect to the shrub." (W. J. Bean, Trees and Shrubs in the British Isles,vol. 2, p. 458.)

Ulmus pumila L.(Ulmaceae.) 40507. Cuttings of an elm from the Botanical Garden at Pekin. "A weeping variety of the very drought-resistant north Chinese elm, not growing apparently to very large dimensions. Of value as a characteristic ornamental tree, especially fit for cemeteries and for parks in cold and semi-arid sections. Shows up particularly well when planted along embankments alongside water expanses. Chinese name *Lung chao yu shu*, meaning 'Dragon's claw elm tree.'" (Meyer's introduction and description.)

Ziziphus jujuba Miller.(Rhamnaceae.) 40506. Cuttings of a jujube from near Pinchow, Shensi, China. "A local variety of jujube, having large and heavy fruits of elongated form; considered to be the second best jujube in China, the *Pai hsiang chen* variety coming first. Color of fruits reddish-brown, meat quite solid and very sweet, size often as large as small hens' eggs. Trees of thrifty growth, attaining remarkable dimensions for jujubes, trunks being seen of 1½ foot in diameter. The trees are almost spineless when old and sucker but very little. Apparently not attacked by 'bunch disease', although infected wild bushes were seen in close proximity. Propagated by suckers exclusively. The wood of this jujube is extensively used in the manufacture of combs and in all sorts of turnery work, this industry having its seat in and around the village of Ta fu tze. Chinese name, *Chin tsao* and *Fei tsao*, meaning 'Golden jujube,' and 'Fat jujube.'"(Meyer's introduction and description.)

NOTES FROM CORRESPONDENTS ABROAD.

Jamaica. Port Antonio. Mr. M. Cork writes June 6: "There are several ways of using the Papaya in cooking meat; the fruit is used green, peeled, cut in slices and laid on the meat, left there for 10 or 15 minutes. Then the meat is cooked; or the leaf and stalk can be bruised and the juice put on the meat which is cooked at once. The best way is to experiment, for the papaya there may not be as strong as the one here. There is an old saying here that if an animal were to be tied under a papaya tree and left there for an hour it would die. My cook uses the stalk of the papaya leaf when cooking steak, peels the stalk and cuts it in slices, then puts it on the steak and beats it gently so that the juice comes on it. She then pours a little vinegar over it all and leaves it to soak into the steak for five or 10 minutes. She then puts it on the fire and covers it up, and when it begins to steam takes the papaya away. That with the vinegar gives a nice flavor to the meat. Of course if the meat is *very* tough it may require longer than 10 or 15 minutes to make it tender. Another way is to bruise the leaf and wrap the meat in it, but five minutes ought to be long enough done in that way. Always use a little vinegar; it helps both to make the meat tender and gives a nice flavor."

China. Shanghai. Mr Frank N. Meyer writes June 17: "In speaking about diseases, this reminds me that here in Shanghai the white-wax insect has become a serious pest in privet-hedges (*Ligustrum lucidum*) and is very hard to dislodge. Mr. D. MacGregor, Superintendent of parks here, showed me the other day several dead bushes in a large privet hedge, disfiguring the whole ensemble and caused by this white-wax insect and by some large globular scales, of which I have collected some.

"On June 12th, I bought 250 pounds of fresh lytchee fruits and had them cleaned and washed; they cost 8¢ Mex. silver per pound, but I got only about 20 lbs. of good seeds out of them. Now the problem is however that these lytchee seeds started to germinate already on Tuesday morning and I had to remove them to the cool room of the hotel. I am intending to put them in the cool room of the S. S. Manchuria, which leaves on June 25th for San Francisco.

"I am not sure at all whether I can obtain any inarched lytchee plants. The nearest place they have them is Foochow and then again near Canton. Both these places have dialects all of their own and one needs special in-

terpreters; the heat down there in summer is said to b something fierce as both Mr. Swingle and Mr. MacGregor ar telling me and last not least, the Shanghai authorities d not allow any plants from Canton with earth around thei roots to be landed here, for fear of plague, and othe bacterial diseases that are endemic there. I am also fa from certain whether one can buy suitable grafted or in arched plants right away. For serious South Chinese ex ploration work I will need more time than I have now

On Sunday night, May 30th, we arrived in Nanking, th next day I went to see the acting American consul Mr A. W. Gilbert and heard that Mr. Joseph Bailie, whom wanted to see in particular, as regards his afforestatio experiments, was out in the country on an inspection trip

We had a telegram sent up to him and on Wednesda evening he came down again to Nanking. The next day went with him over the Western slopes of the Purple Mount ains and over a tree nursury; on Friday June 4th we visite some local forest-growth and another nursery; On Saturda June 5th we looked over some gardens and on Sunday Jun 6th we made an excursion to the Panhua mountain, some 2 miles away from Nanking, where quite some original tre growth has still been left, being protected by the Bud dhist monks of a large temple, on the top of the mountain

The reforestation experiments as carried-on on Purpl Mountain, show promises that a dense tree growth can b established with relatively little outlay.

A few things in and around Nanking struck me as bein of decided value to us in America, viz: plenty of tree everywhere of the "Huang lien shu" (*Pistacia chinensis*), o which the wood is an esteemed timber, used in cart build ing, while the young sprouts are eaten mostly pickled.

Ulmus parvifolia, "Chia yu shu", another timber tree o much promise; thrives everywhere, fruits ripen in the au tumn.

Quercus variabilis (*O. chinensis*) "Mau li siang shu" a goo timber tree for rocky slopes; valuable for railway sleep ers.

Dalbergia hupeana "T'an shu"; trees of medium size, i looks in between *Sophora japonica* and *Cladrastis amurensis* lumber exceedingly heavy and tough; used in cart buildin and in turnery work; can thrive on thin rocky soils.

Albizzia chinensis (*A. lebbek*), "Shan huai shu", very or namental with its feathery leaves and whitish tufts o tasselled flowers. Thrives on rocky places; wood hard used in carpentry.

Liquidambar formosana, "Fung hsiang shu", a sweet gum growing to very large sizes, the wood not highly appre-

ciated, being of easily decaying properties but being light and non-odoriferous, much used for making tea chests and other boxes.

"Then I noticed the real Oriental persimmon, *Diospyros kaki*, *wild* all over the mountains. The fruits are said to be small, of red color and quite puckery.

"Chestnuts too occur here and there and in so far as I saw a few trees, they seemingly had no bark disease.

"We are having here some sultry, sticky weather, with occasional showers and the air as humid as can be, not very conducive to quick movements, as my hands even stick to the paper I am writing on.

"The markets, however, are very interesting; heaps of fresh lytchees; fresh mangosteens (without any flavor); good yellow mangos; fine golden loquats; ripe plums (*Prunus triflora* and *P. mume*), the last also sold freshly pickled in brine and eaten out of hand with powdered liquorice root sprinkled over it, quite appetizing! Then several varieties of peaches, green crab-apples, the last apricots of the season, while new *Nagis* are just coming in. We also have an abundance of shoots of *Kau ba*, *Zizania latifolia*; last Saturday Mr. Swingle and I had them for lunch at the Astor House, boiled in water and served hot with a cream sauce; they tasted like Jerusalem artichokes, with a bit of young parsnip flavor added; last night I had them sliced, well scalded and served cold with a dressing, as a salad they tasted somewhat like bamboo, like reed-sprouts and like celeriac. This vegetable certainly has a future ahead in America. In the foreign hotels here they call them water bamboo sprouts!

"Mr. MacGregor has shown me over his new parks, which have prospered amazingly, only they have had a very severe winter, the mercury went down to 15° Fahr. in January, 1915, and as a result the camphor trees were totally defoliated; *Chamaerops excelsa* losing many leaves; some oleanders frozen to the ground; *Eucalyptus gunnii*, one of the hardiest of the genus, has been killed outright, except in some very sheltered localities; hardy Japanese lemons suffered badly, but a hardy tangerine tree, 20 feet high and of local origin, escaped unhurt.

"Shanghai as a town has grown largely since I was here last in 1908, but as business is much depressed on account of the war, life seems much duller here than formerly. Still Shanghai seems to be destined to become the New York of China, just like Hangchow is said to develop into the Chicago of this gigantic land."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collec
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
Allen M. Groves, Nathan Menderson, and G. P. Van Eseltine, sistants.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, Assistant in charge of Brooksville, Fla., Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Issued August 21, 1915.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 109. May 1915.

Genera Represented in this Number.

Ampelopsis	40738-739	Lonicera	40689-691
Asparagus	40617		40695
Avena	40650	Malus	40619
Berberis	40681-688		40729
Citrus	40674-676	Pistacia	40662
Cotoneaster	40730	Prunus	40623
	40734-737	Psoralea	40744
Cudrania	40618	Pyrus	40724-728
Daphne	40613	Rhus	40716-717
Euonymus	40696-698	Rosa	40699-702
Gentiana	40670		40768
Hippophae	40715	Solanum	40759-760
Hordeum	40652	Syringa	40709
Juniperus	40677-680	Viburnum	40692-694

Plates:

Cluster of fruit of Itamaraca mango, Rio de Janeiro.
The Sepulchre of Con-fu-tse (Confucius).

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Ampelopsis sp.(Vitaceae.)40738-739. Seeds from Shensi, China. 40738. "From near Mei hsien. A trailing vine, closely resembling *Ampelopsis dissecta*, but with larger leaves and broader winged leaflets. Color of berries dull yellow. Found between stony debris. Of value as a porch and trellis vine, especially for the drier sections of the United States." 40739. "From near Nan chi chen. A trailing vine, making long annual shoots, which sprout up from a short woody base or crown; leaves dissected, berries dark violet-black. Found amongst stony debris. Of use as a cover plant hiding stony and unsightly places, also for planting along terraces." (Meyer's introductions and descriptions.)

Asparagus lucidus Lindl.(Convallariaceae.) 40617. Plants of an asparagus from the Bureau of Productive Industry, Taihoku, Formosa. "From Mt. Daiton, near Taihoku. Japanese name *Ten mondo* or *Kusasugi-kadsura*. A perennial herb growing wild on seacoasts and also cultivated in fields. There are standing and climbing varieties. In summer it produces small yellowish flowers, which are succeeded by little red berries. The tuberous roots grow in tufts about the size of a finger and are preserved in sugar, or used for various cooking purposes after having been boiled in water to take away the acidity." (Useful Plants of Japan.)

Avena nuda Hoejer.(Poaceae.)40650. "Huskless oats from Pao dji, Kansu, China. Cultivated in the higher regions of Kansu and Thibet as a human food. The grains are slightly parched, ground into flour, and this is mixed with weak tea, and eaten as a porridge. Flour from non-parched oats is also much used in the making of noodles and for certain coarse cakes. These oats are apparently able to stand more drought and heat than hullless barley which is also much grown in the higher mountain regions of northwestern China. They are however, apparently not as productive as the hullless barley and the flour has not quite the rich flavor that the barley flour has. Of interest to breeders and of value for the inter-mountain sections of the United States." (Meyer's introduction and description.)

Berberis spp.(Berberidaceae.)40681-688. Eight barberries from Kansu, China, some very low growing, others up to 20 feet high, with varying shades of red berries produced in great profusion. All recommended for trial as ornamentals. (Meyer's introductions.)

Citrus spp.(Rutaceae.)40674-676. Three varieties of citron from the Lamao Experiment Station, Lamao, Bataan, presented by Mr. P. J. Wester, Horticulturist. Two varieties remarkable for precocity, one of them, perhaps the smallest citrus in the genus, practically ever bearing, the other highly aromatic and differing strikingly from the citron in its growth.

Cotoneaster spp.(Malaceae.)40730, 40734-737. Seeds of five species of cotoneaster from Kansu, China. 40730, "a tall vigorous species, with rather large leaves and large, dark-violet berries, found on rocky cliffs and ledges, collected at an elevation of 6000 feet." 40734, "a very small bush, crawling between stones and grass, at elevations between 6000 and 11000 feet, of value as a rockery plant." 40735 and 40737, "medium sized shrubs, one with small foliage and black berries, the other resembling *C. pyracantha*, with bright red berries." 40736, "small, with small, orange-colored berries and very small foliage, found on stony mountain sides." (Meyer's introductions and descriptions.)

Cudrania javanensis Trecul.(Urticaceae.)40618. Cuttings from the Bureau of Productive Industry, Formosa, from Mt. Daiton, near Taihoku. "*Kwakwatsu-gayu*, an evergreen shrub of the family Urticaceae, of a vine-like nature, provided with thorns on the stems, and found in the provinces of Satsuma and Osumi. The barren and fertile flowers shoot separately on distinct plants. It bears flowers in summer and reddish yellow sweetish fruits in winter. They are eaten fresh or preserved in sugar. The wood is used for dyeing yellow." (Useful Plants of Japan, no. 213b.)

Daphne blagayana Freyer.(Thymelaeaceae.)40613. Plants from Chester, England. Purchased from Dicksons. "A dwarf, evergreen shrub of spreading habit. Leaves smooth, 1 to $1\frac{3}{4}$ inches long, aggregated in a tuft at the end of the twig. Flowers creamy white, very fragrant, produced in March and April, crowded in a head of 20 to 30 blossoms at the end of the twig and about two inches across, consisting of several umbels, subtended by thin greenish, silky bracts. Fruit pinkish white, rarely seen in cultivation. Native of the mountains of eastern Europe, discovered by Count Blagay in 1837, introduced about 1875. This beautiful and sweet-scented Daphne has perhaps nowhere been so successfully cultivated as in the Glasnevin Botanic Gardens. It is there planted on low mounds composed of stones and loam from a granite district. The secret of

success appears to be in the continuous layering of the shoots. As soon as the young growths are an inch or so long, the previous summer's branches are weighed down to the ground by placing stones on them. A little soil may come between. By this system the whole plant is always renewing its root system at the younger parts. At Glasnevin I have seen a patch 8 feet across, in the rudest health. This system is, no doubt, helped by the moist, equable climate of Dublin. As this shrub is found on calcareous rock, stones of the same character would appear to be preferable for layering, but Sir F. Moore tells me he does not consider this Daphne needs lime. He recommends good loam or peat and leaf-soil and partial shade."(Abridged from W. J. Bean, Trees and Plants Hardy in the British Isles, vol.1,p.467.)

Euonymus spp.(Celastraceae.)40696-698. Seeds of spindle woods from Kansu, China. Three species, one forming heavy trunks when allowed to grow unmolested, another low-growing, and the third of very small, creeping growth, found on shady places amongst scrub and moss, at altitudes of between 7000 and 8000 feet." (Meyer's introductions and descriptions.)

Gentiana lutea L.(Gentianaceae.)40670. Plants of the yellow gentian from Floraire, near Geneva, Switzerland. Presented by Mr. H. Correvon. "A tall, stout, hollow-stemmed perennial herb of open or partly open grassy places on the mountains of southern and central Europe. Its large flowers are bright-yellow and spotted, and occur in axillary clusters. The underground portion is frequently a yard in length, and may have several long branches. It is commonly collected in flower. To prevent its extermination the Austrian government imposed a heavy fine for collecting a root not at least 2 cm. (nearly an inch) in diameter at the top, this ordinarily requiring a three years' growth and insuring its previous propagation by seed. The United States supply comes chiefly from Europe."(The National Standard Dispensatory.)

Hippophae salicifolia D.Don.(Elaeagnaceae.)40715. Seeds of a sea-buckthorn from near Pao dji, Kansu, China. "A species of sea-buckthorn, reaching a height of 40 feet, with a trunk 2 feet in diameter; leaves larger than in *H. rhamnoides*; berries of pale waxy color, very sour. Occurring in mountain ravines and on pebbly creek bottoms, sometimes to the exclusion of almost everything else. Of value as an ornamental park tree, suited especially for

the cooler and drier sections of the United States. Collected at an elevation of 7000 feet above the sea. Chinese name *Tsuan tzu*, meaning 'sour thorn.'"(Meyer's introduction and description.)

Hordeum vulgare L.(Poaceae.) 40652. Barley from Kincheng, Kansu, China. "Hullless barley, cultivated up to 11000 feet above sea on mountain terraces in western Kansu and Thibet. Much used as a human food and in some sections the mainstay of the people. The grains are parched, ground into flour, and this flower is eaten mixed with hot tea, butter or grease, when obtainable, and often a bit of salt added. Most times it is consumed in the form of a stiff dough, manipulated and eaten with the fingers and called *tzamba*. Another way is to pour hot water or milk on it and eat it as a gruel or porridge. The flour from non-parched grains is used in the form of noodles, often much mixed with flour from broad beans from which it receives a coarse flavor. Of value for the more elevated regions of the United States." (Meyer's introduction and description.)

Juniperus spp.(Pinaceae.) 40677-680. Seeds of junipers from Kansu and Shensi, China. 40677,"A peculiar species of juniper, of weeping habit, forming long cord-like branches, which hang down perpendicularly from the crown. Able to stand much drought and heat, but apparently quite sensitive to severe frosts. Of value as a quaint ornamental tree for cemeteries, especially for the drier sections of the United States. Chinese name *Tzu pei shu*, meaning 'pointed conifer.'" 40680,"A beautiful pyramidal variety of juniper of bluish color, found in an old temple-court." (Meyer's introductions and descriptions.)

Lonicera spp.(Caprifoliaceae.) 40689-691, 40695. Seeds of honeysuckles from Kansu, China. Four shrubby species, all of possible value as ornamentals for the cooler portions of this country. (Meyer's introductions.)

Malus formosana Kaw. & Koidz.(Malaceae.) 40619. Seeds of a recently described native Formosan apple, received from the Bureau of Productive Industry, Taihoku, Formosa.

Malus spp.(Malaceae.) 40729. "Seeds of crab apples of various sizes, purchased on the streets of Sianfu, Shensi, China." (Meyer's introduction.)

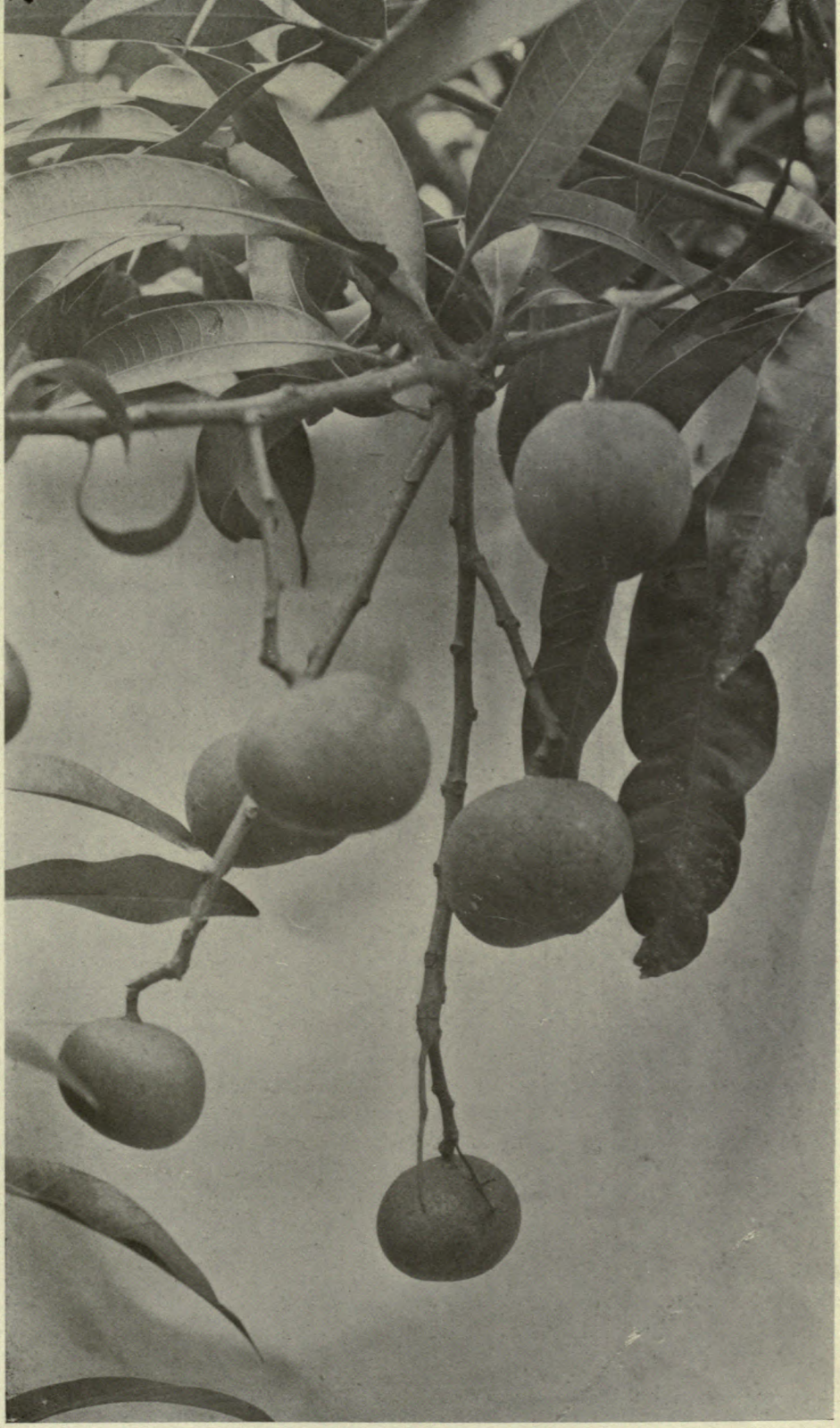
Pistacia chinensis Bunge.(Anacardiaceae.)40662. Seeds of the Chinese pistache from near Kwan yin tang, Shensi,

China. "A beautiful and characteristic Chinese pistache tree, having graceful, pinnate foliage, which, when just coming out is of wine-red color, then becomes glossy green, while toward fall it turns into flaming scarlet, purple and yellow hues. The tree is dioecious and the males become larger and taller than the females. It lives to be several centuries old and can reach truly enormous sizes when very old and when located in a good situation. A tree near the village of Tsai chia pu, Shensi province, has a girth of 16 feet, five feet above ground. Of value as a graceful park and avenue tree, especially for the milder semi-arid sections of the United States."(Meyer's introduction and description.) Persons subject to poison-ivy poisoning should exercise care in handling this tree as one or two cases of severe poisoning similar to that of ivy have been reported.

Prunus sargentii Rehder.(Amygdalaceae.) 40623. Plants of the Sargent cherry from the Arnold Arboretum, Jamaica Plain, Mass. "The first of the Japanese cherries to flower is *Prunus sargentii*. This is a tall tree in the native forests of the northern island of Japan where it is valued as a timber tree. There are six specimens of different sizes on the Forest Hill Road, Arnold Arboretum, and they are now covered with clusters of large pink or rose-colored single flowers, for the color of the flowers of this tree varies considerably on different individuals. The small black fruits which ripen in June are almost hidden by the large dark-green leaves, which in the autumn turn to shades of orange and red; the smooth shining, reddish bark adds to the beauty of this tree. Travelers who have seen cherry blossoms in many lands declare that *Prunus sargentii* should become a common tree if nurserymen will recognize its value and make a business of making it known to the public."(Arnold Arboretum Bulletin of Popular Information, no. 20.)

Psoralea corylifolia L.(Fabaceae.) 40744. Seeds from near Kwei hsien, Shensi, China. "An annual herb, growing from 5 to 8 feet tall, cultivated here and there in patches, on rich bottom lands. Said to be utilized for medicinal purposes, only, the seeds being ground up and forming the main ingredient in Chinese kidney plasters. Of value possibly as a fodder plant for the warmer sections of the United States. Chinese name *Po ku chih*, meaning 'great illness medicine.'"(Meyer's introduction and description.)

Pyrus spp.(Malaceae.) 40724-728. Seeds of pears from Kansu, China. Five species or varieties of pears, some



A BRAZILIAN MANGO.

Nearby view of a cluster of the fruit of the Itamaraca mango, a variety remarkable for its precocity, delightful aroma, the small size of its fruit, and their beautiful red blush. Photo No. 15181, taken Nov. 3, 1913 by Dorsett, Shamel and Popenoe at Hotel Internacional, Rio de Janeiro, Brazil.

THE SEPULCHRE OF CON-FU-TZE, (CONFUCIUS) SURROUNDED BY OLD TREES.

"The large black trunk to the left is an old male specimen of *Pistacia chinensis*, which is several centuries old. The stems in front are of *Juniperus chinensis*. Both of these have been introduced and are now growing in America. This whole ensemble exhales a spirit of the gray, hoary past, from which influence one cannot escape." Photo No. 5348 by F. N. Meyer, taken August 7, 1907, at Chu fi, Shantung, China.

wild, some cultivated on a small scale, the fruits varying in size and color, all of value possibly for breeding purposes. (Meyer's introductions.)

Rhus sp. (Anacardiaceae.) 40716. Seeds of a sumach from near Yü yin chen, Kansu, China. "A sumach, found on stony mountain slopes, in ravines and on wild places; growing into a tall shrub or small tree. Leaves large, light green, pubescent, winged. Fruits borne in large spikes; berries coated with a sticky whitish wax which burns readily. The Chinese do not seem to utilize this wax in any way. Of value as an ornamental park shrub for the mild wintered sections of the United States." (Meyer's introduction and description.)

Rhus javanica L. (Anacardiaceae.) 40717. Seeds of a sumach from near Kwan yin tang, Shensi, China. "A sumach with medium sized, glossy green leaves and reddish petioles, growing into a tall shrub or even into a tree up to 60 feet high. Assumes most brilliant colors in fall. Produces many spikes of reddish-bronze colored berries which persist on the trees for a long time. On this sumach a gall insect makes its home, producing large inflated galls, which the Chinese utilize much for dyeing black. The foreigners however, found out that they contain a great percentage of tannin and used them for tanning purposes, vast quantities being exported from Hankow especially, under the name of 'Chinese gall-nuts.' This sumach possibly might be cultivated on cheap lands in the Southern States for its gall production. It is not very particular as to soil requirements, but it loves good drainage. Care should be taken however, to keep it well under control as it has decidedly weedy tendencies. Chinese name *Wu bei tzu shu*, meaning 'Five folded seed tree.'" (Meyer's introduction and description.)

Rosa spp. (Rosaceae.) 40699-702, 40768. Seeds of roses from Kansu, China. 40699, *Rosa sweginzowii* Koehne, "from near San sze miau. A wild rose, resembling *R. hugonis*, of very vigorous growth and having remarkably broad spines, which vary much in size and in quantity on various specimens. Found on rocky mountain slopes at elevations between 5000 and 8000 feet. Of value possibly as a factor in hybridization experiments." 40700, "from near Chiao tchwan chen. A very vigorously growing rose of climbing habit, overrunning clumps of shrubbery. Bears very large clusters of orange-red berries; foliage large, slightly pubescent. Of value as a vigorous stock. Collected at an

elevation of 4000 feet." 40701, "from near Tjin ya tan. A bushy rose, of erect growth, averaging a height of 5 to 7 feet. Twigs of reddish color, almost spineless. Collected at an elevation of 7000 feet." 40702,"from near Yau pu ko. A shrubby rose, quite spiny, found on dry stony mountain-slopes. Flowers apparently yellow." 40768,"from near Cheng hsien. A wild rose, of very vigorous growth, found as big clumps amidst scrub or as solitary specimens on stony places. Makes long annual shoots, which lean over in a characteristic way. Collected at an elevation of 3000 feet." (Meyer's introductions and descriptions.)

Solanum melongena L.(Solanaceae.) 40759-760. Seeds of eggplants from Yang ping, Shensi, and Pai hsiang chen, Shansi, China. One variety having "very large purplish white fruits, apparently a good market variety, grown under irrigation on the rich flats along the Wei River," the other "with medium sized fruits of pure white color." (Meyer's introductions and descriptions.)

Syringa sp.(Oleaceae.) 40709. Seeds of a lilac from near Pa li tang, Kansu, China. "A small lilac, growing from 3 to 5 feet in height, having small leaves and apparently very floriferous. Found covering whole loess hill slopes in company with *Amygdalus davidiana* at an elevation of 3500 feet. Of value as a hardy flowering shrub for the dry and cool sections of the United States." (Meyer's introduction and description.)

Viburnum spp.(Caprifoliaceae.) 40692-694. Seeds of two species of Viburnum from Kansu, China, all decidedly ornamental, and bearing large racemes of dark red berries. (Meyer's introductions.)

NOTES FROM CORRESPONDENTS ABROAD.

China, Chehkiang province, Hangchow. Mr. Frank N. Meyer writes, July 1: "A week again has passed since I first landed here and I want to let you know what things I have seen. Firstly this: we are in the rainy season and every day it pours and pours until one would think there was nothing left and just as things begin to lose their glistening coat of wetness then it starts again. We have been out collecting several times and got drenched and now our clothes have started to mould badly, our straw hats are black and with peculiar spots and on the ribbons colonies of fungi establish themselves overnight.

"Well, I have a few interesting discoveries to report, firstly there are many specimens of *Castanea mollissima* scattered at the bases and on the lower slopes of the hills around here, and -- these chestnuts are seriously attacked by the bark-fungus, and in my estimation are going to succumb to it these coming years. The chinquapins, however, which are very abundant on the higher and more sterile hill slopes, seem to be immune, at least, I did not see any evidences of damage or even of attacks. This brings another interesting point to my mind. I was told in Nanking that various missionaries at Kuling, the great summer resort in central China for missionaries, were cutting down their chestnuts, as the tops were all dying, due to borers working underneath the bark. (Of course this last cause is the most easily explainable to laymen). But now this is the point: when chestnuts here in eastern central China are only recently being attacked seriously then the disease might have come from some other locality, like from north China possibly, or this *Diaporthe parasitica* might have become, through mutation or whatever else, much more aggressive of late, than in periods gone by. What do specialists say on this question?

"The second of my more important observations are that -- hickories occur wild in the mountains near here. I bought some samples of nuts in town and was assured that the trees producing them grow wild in the Fung huang shan region to the west and southwest from here. I found a large tree of a Pecan-like appearance in a densely wooded valley on the slopes of the Pan shan, a few hours from here to the northeast and within some days I may have found the real hickory-nut-tree, which has not been reported from China up till now. Wilson in his second volume of 'A Naturalist in China', makes special mention of this fact. Chinese here call them hickory-nuts *sa ho to* and *sa kuo* meaning 'sand walnut' and 'sand nut'; why, we have not been able to ascertain as yet. I am sending you, by separate parcel, a small quantity of these hickory nuts. If you see fit, would you kindly ask Professor Sargent's opinion regarding them. I am making arrangements with Dr. Duncan Main here, to send you some fresh nuts this coming autumn.

Another thing I found on a spur of the Pan shan at an elevation of c. a. 1500 ft. a. s. were wild tea-bushes in a dense thicket of *Ilex cornuta*, *Castanea pumila*, dwarf bamboo, *Juniperus sp.*, etc. On this same spur I found wild camphor-trees, wild tallow trees, (*Sapium sebiferum*) lots of wild *Diospyros kaki*; wild *Yang mae* trees (*Myrica rubra*), *Exochorda grandiflora*, *Chionanthus retusa*, *Symplocos sp.*,

Lindera sp., *Pistacia chinensis*, several species of oaks and minor scrub. Quite a rich and interesting flora.

"On the low lands, in dense copses of *Quercus variabilis*, *Liquidambar formosana*, mulberries, plums and loquats, I found the white barked persimmon. A few trees that had not been grafted to *D. kaki* had fruits on them, which are quite hairy, as are the calyx, the leaves, young shoots and petioles. A few local people whom we asked the name, called it the *Yu shi tze* or 'oil persimmon', apparently.

"With Dr. Main and Mr. Kennedy I'll make some arrangements to send us seeds and scions this fall. The marvel of this white barked fellow is that it delights on places where it is only a few feet above the water's edge and where dampness and shade reign for the greater part of the year, while *D. lotus* and *D. kaki* are just the opposite, although the last one also stands considerable shade, when seen wild on stony mountain slopes near Nanking and around here.

"Yesterday I took some natural size photos of the large Yangmae-fruits (Nagi's) we have here and also of the wild ones which I collected on the Pan Shan. My! the last ones are only one-fourth the size of the big ones. This fruit I consider promising for certain sections of Florida and for California; it may possibly be grafted on local stock-plants."

Japan. Tokyo. Mr. Y. Takahashi, Acting Mayor, writes June 8: "I am very glad to inform you that the dogwood trees, the gift of the Washington government to the city of Tokyo through Mr. W. T. Swingle, arrived in splendid condition. The trees were immediately planted in the Hibiya Park, near the Imperial Palace. I am sure, in a few years when the trees are in blossom, they will be one of the most flowery sights of the park and a constant reminder to our citizens of the kindly feeling of your government and country. Will you express to the Washington government and your country the hearty thanks of this city for its beautiful and generous gift?"

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
Allen M. Groves, Nathan Menderson, and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
---------- In charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Date of Issue: Sept. 7, 1915.

PROPERTY OF DIVISION OF FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 110. June 1915.

Genera Represented in this Number.

Acrocomia	40881	Dioscorea	40892
Annona	40835	Durio	40826
Bambos	40886	Passiflora	40843
Canarium	40827		40852
Cephalostachyum	40887		40837
Citrus	40824	Phyllostachys	40842
	40893		40851
Clematis	40844	Primula	40857
Cracca	40894-895	Pyrus	40865-871
Dendrocalamus	40888	Ziziphus	40853
	40889		40877-878

Plates:

A Cashew Tree in an Orange Orchard in Bahia, Brazil.
A Field of Ginger in Shantung Province, China.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Acrocomia fusiformis (Swartz) Sweet. (Phoenicaceae.) 40881. Seeds of a palm from Santiago de las Vegas, Cuba. Presented by Mr. Juan T. Roig, Botanist, Cuban Agricultural Experiment Station. "*Macaw tree* of Jamaica, *Corozo de Jamaica* of Cuba. Trunk ten to thirty feet high, fusiform or swollen above the middle, armed with spines in rings. Leaves pinnate, petioles and rachis densely armed. Inflorescence enclosed in two spathes, inner complete, sparingly armed. Peduncles also armed with long black spines. Fruit depressed-globose, about one inch in diameter, smooth. Seed very hard, one-celled, foramina lateral. A remarkably strong fiber called *pita de corozo* is extracted from the rachis of the leaves of this palm, and is used in Cuba in the manufacture of brushes. This Palm has been erroneously referred to as *Acrocomia lasiospatha* by Martius and Grisebach." (C. P. Doyle.)

Annona scleroderma Safford. (Annonaceae.) 40835. Seeds of the "pox-té" from Cajabon, Guatemala. Presented by Mr. W. E. Curley at the request of Mr. O. F. Cook. Mr. Cook in his field-notes made the following entry: "The fruit called by the Kekchi Indians of Alta Verapaz *box-te* or *bosh-te*, is curious rather than beautiful. The shell is divided into angular depressed areoles by raised ridges. When mature the ridges are dark brown and the areoles between them green. The pulp is readily separable into slender pyramids. These are normally one-seeded, but in many cases they are seedless. The texture of the pulp is perfect, the flavor aromatic and delicious, with no unpleasant aftertaste. It is much richer than the soursop, with a suggestion of the flavor of the *zapote blanco*, or *matasano* (*Casimiroa edulis*), but not in the least objectionable. It can be eaten most conveniently with a spoon. The most fragrant pulp is close to the rind. The seeds separate from the surrounding pulp more readily than in most annona fruits."

Bambos tulda Roxb. (Poaceae.) 40886. Seeds of a bamboo from Calcutta, India. Presented by Mr. William Bembower, Collins, Ohio. "The common bamboo of Bengal, where it grows in great abundance everywhere, flowering in May. Not uncommon in the deciduous forests of Pegu, generally occupying lower and moister stretches of ground in company with *tinwa*, *Cephalostachyum pergracile*, the surrounding dry hills being covered with *Dendrocalamus strictus*." (Brandis.) "An evergreen or deciduous, caespitose, arboreous, gregarious bamboo. Culm green or glabrous when young, grey-green when older, sometimes streaked with yellow, 20 to 70

feet high, not or little branched below, 2-4 inches in diameter; nodes not swollen, the lower ones fibrous-rooted; internodes one to two feet long, white-scurfy when very young, ringed with white below the nodes, the walls thin, three to five-tenths inch; branches many from nearly all the nodes, those of the lowest ones thin, nearly leafless, horizontal."(J. S. Gamble, Bambuseae of British India, in Annals of the Calcutta Botanic Garden, vol. 7, p. 30.) The culms of this bamboo supply the well-known Calcutta cane, in such great demand for fish-rod-making, and at present almost unobtainable. Plants introduced in 1907 have produced canes 70 feet in height at Mayaguez, Porto Rico. This bamboo should be tried for windbreaks in Porto Rico, and may succeed in frost-free parts of Florida where great depth of soil is to be had. (S. C. Stuntz.) Both of the species mentioned above are described in this number of Plant Immigrants.

Canarium commune L.(Burseraceae.) 40827. Seeds from the Botanic Garden, Buitenzorg, Java. "A large handsome Malayan tree, characterized by a remarkable buttressed trunk and laterally compressed aerial basal roots; the latter develop enormous erect flanges of uniform thickness, so that solid circular pieces may occasionally be cut out from them to form ready-made cart wheels. The tree is much cultivated for shade or ornament in Java. It bears in great abundance large pendant clusters of dark-purple fruits, which are of the size of small plums; these are produced all the year around, but chiefly in June. The kernel of the fruit is edible, being similar in flavor to sweet almonds; it yields, by expression, an oil used for burning in lamps and for cooking purposes. A desirable tree for planting in avenues, etc. It thrives in hot and moist districts up to about 1500 feet elevation, and prefers deep, well-drained soil. Propagated by seed, which may be sown in nursery beds, and kept moist and shaded until germinated."(Macmillan, Handbook of Tropical Gardening and Planting.)

Cephalostachyum pergracile Munro.(Poaceae.) 40887. Seeds of a bamboo from Calcutta, India. Presented by Mr. William Bembower, Collins, Ohio. "A deciduous, arboreous, tufted bamboo, with glaucous-green culms 30 to 40 feet high, two to three inches in diameter, and rather thin walled, the walls usually about one-half inch thick. It is one of the chief bamboos of Burma and one of those most frequently found in association with teak. This beautiful species

is used for covering Burmese cigarettes. This bamboo flowers usually sporadically, so that.clumps in flower may almost always be found; and consequently it has been largely and often collected; at the same time, like other species, it sometimes flowers gregariously as it is doing this year (1894) both in Sikkim and in Dehra Dun. Of its straggling habit, so noticeable in the forests of Bengal and Burma, but curiously much less so in the Dun, J. W. Oliver remarks, 'When they have no trees to support them, the main stems bend over, forming impenetrable thickets, and the lateral branches ascend vertically often forming shoots nearly as long as the main stems.' This species is very easily identified by its panicle of bright purple-red flowers, and when out of flower the grey stems, long, nearly glabrous stem sheaths and straggling habit cause it to be easily recognized. The long hairy points to the anthers are also remarkable."(J. S. Gamble, Bambuseae of British India, Annals of the Calcutta Botanic Gardens, vol. 7, p. 85.)

Dendrocalamus strictus(Roxb.)Nees.(Poaceae.)40889. Seeds of a bamboo from Calcutta, India. Presented by Mr. William Bembower, Collins, Ohio. "A very useful and strong bamboo of India, formerly used universally for spear shafts. The plant flowers frequently and does not die down after flowering as is the case with so many bamboos. The culms are said sometimes to reach a height of 100 feet. This is the most common and most widely spread and most universally used of the Indian bamboos, and is commonly known as the 'male bamboo.' Its culms are employed by the natives for all purposes of building and furniture, for mats, baskets, sticks and other purposes. It furnishes, when solid culms are procurable, the best material for lance shafts. In Burma, when large culms are obtainable, they are much in request for mats for native boats. It flowers gregariously over large areas, as it did in the Central Provinces in 1865, but it may be found flowering sporadically, a few clumps at a time, almost every year, in any locality, and such clumps then usually die off. These flowerings however, do not produce as much good seed as when the gregarious flowering takes place. The flowers appear in the cold season between November and April, the seed ripening in June. The leaves fall in February or March, and the young new ones appear in April. The young culms are rather late, usually beginning to appear in July sometime after the rains begin."(J. S. Gamble, Bambuseae of British India, Annals of the Calcutta Botanic Gardens, vol. 7, p. 79.)

A CASHEW TREE IN AN ORANGE ORCHARD IN BAHIA, BRAZIL.

Although the Cashew (*Anacardium occidentale*) has grown and fruited in Florida, the attention of horticulturists has not been forcibly attracted to it. In Southern Brazil it appears as an important market fruit and on the island of Itaparica a strain occurs which is especially famed for its large excellent fruit. The mild acid fruit is eaten fresh or made into wine, jams or jellies. The hard kidney-shaped nut borne upon the blossom end of the fleshy pear-shaped receptacle (the cashew apple) contains a rich highly flavored kernel, which if served hot is one of the most delicate nuts known. These are the cashew nuts of commerce. The hard shell which surrounds the nut, has inside a layer containing a most acrid corrosive oil which attacks the skin more actively than does poison ivy. This oil can be easily driven off by heat but the fumes are extremely acrid. Photo No. 14468 by Dorsett, Shamel and Popenoe, Dec. 9, 1913, in Bahia, Brazil.

A FIELD OF GINGER IN SHANTUNG PROVINCE, CHINA.

The consumption of Chinese Ginger (*Zinziber officinalis*) in America, although it might still be ranked as a delicacy, amounts to half a million pounds yearly. Its preparation as preserved, dried or candied ginger is so simple that any housewife could learn how to do it and since the underground rhizomes will stand quite low temperatures it should be worth while to distribute it throughout the South and Southwest for dooryard garden cultivation either with or without irrigation. The Chinese use it fresh as well as preserved. Photo by F. N. Meyer, No. 5342, taken Sept. 8, 1907, at North Ninyang, Shantung, China.

Dioscorea fasciculata Roxb.(Dioscoreaceae.) 40892. Tubers of a yam from Manila. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture. "*Tugue*. Flesh white, and mealy but firm and a little fibrous, sweetish. The quality is not equal to that of the *yampi* of Jamaica." (R. A. Young.)

Durio zibethinus Murray.(Malvaceae.) 40826. Seeds from the Botanic Gardens, Buitenzorg, Java. Presented by the Director. "A very large, handsome, pyramid-shaped tree, native of the Malayan Archipelago, and commonly cultivated in the Straits, Burma, Java, etc., for the sake of its celebrated fruit. The latter is produced on the older branches, varies somewhat from round to oval in shape, and usually weighs from five to seven pounds or more. It is armed with thickly set formidable prickles about one-half inch long; when ripe it becomes slightly yellow, and possesses an odour which is intensely offensive to most people, especially on first acquaintance with it. The cream-coloured pulp surrounding the seed is the edible portion; this is most highly prized by the Malays and oriental people, and is also relished by Europeans who acquire a taste for it. Firminger describes it as 'resembling blanc-mange, delicious as the finest cream,' whilst Mr. Russell Wallace considered that 'eating durians is a sensation worth a voyage to the East.' The large seeds may be roasted and eaten like chestnuts. Pounded into flour, they are said to be sometimes made into a substance like 'vegetable-ivory.' The durian tree thrives in the moist low-country of Ceylon up to 2000 feet elevation, and luxuriates in deep alluvial or loamy soil. In Peradeniya Gardens, there are magnificent specimens well over 100 feet in height. They usually flower in March or April, and the fruit is ripe in July or August. Durian fruits are variable in size, shape, flavour and quantity of pulp, according to variety. The trees also vary in productiveness, some varieties being almost barren. Selection and high cultivation should therefore be practised in order to obtain the best fruits. The tree is readily propagated by seed if sown fresh; the seed is of short vitality and germinates in seven to eight days."(Macmillan, Handbook of Tropical Gardening and Planting.)

Passiflora alata Curtis.(Passifloraceae.) 40843. Seeds of a passion-fruit from Honolulu, Hawaii. Presented by Mr. Garret P. Wilder. "This is a strong vigorous vine, very suitable for arbors and trellises. It is not commonly found in Hawaii; however, a very fine specimen of its

kind is growing in Dr. St. D. G. Walter's garden in Honolulu. The leaves are oval to ovate, the petioles having two glands. The fragrant purple flowers are about two inches in diameter. The ovoid-pointed fruit has a tough, leathery shell which, when green is six-striated, with white stripes; when quite ripe the fruit is a dull orange-yellow. The numerous seeds are imbedded in the juicy, scented pulp, which is aromatic and delicious. Propagation is by seed and by cuttings." (G. P. Wilder, Fruits of the Hawaiian Islands.)

Passiflora edulis Sims.(Passifloraceae.) 40852. Seeds of a passion-fruit from Guemes, Argentina. Presented by Mr. H. F. Schultz, Director, Agricultural Experiment Station. "At Jujuy I found another variety of edible Passiflora which, I think, is superior to the variety I mailed you before. The fruit is roundish, smooth and of a very attractive yellow color, of a rather pale shade and not unlike a *Yellow Richard* apple. The fruit measures about 7 to 8 cm. in diameter. The pulp is bluish purple in color, and, in my opinion, is more spicy than the other variety. The plant is very precocious and a good, strong grower, for which reason it should be planted about 8 meters one from the other and be trained on four or five wires, a foot apart, each, the upper one about 1.80 meters high. I do not know where the variety originally came from; a friend of the proprietor purchased some fruits in Covent Garden, London, and brought him the seeds. The price for the fruit there, at that time was two pence each, while the fruits of the Queensland variety sold at three pence each."(Schultz.)

Passiflora laurifolia L.(Passifloraceae.) 40837. Seeds of a passion-fruit from Honolulu, Hawaii. Presented by Mr. Garret P. Wilder. "This strong-growing, glabrous vine, climbing by tendrils, is a native of tropical America and known there as the *Yellow waterlemon*. The date when it was introduced to Hawaii, and by whom, is not known, but in the Hilo and Hamakua districts of Hawaii this variety grows wild. Its thick leaves are oval, oblong and entire, and have a short, sharp point. The flowers are about two and a half inches across, are white, with red spots on them. The fruit is slightly oblong, 2 inches in diameter, and very regular in size and shape. When ripe, it is yellow, spotted with white. It has a medium-hard shell or skin, and the edible pulp is whitish-yellow, and contains many flat, black seeds."(G. P. Wilder, Fruits of the Hawaiian Islands.)

Phyllostachys sp.(Poaceae.) 40842, 40851. Plants of a bamboo from Burroughs, Ga. Secured through Mr. S. B. Dayton, by Mr. Edward Simmonds, of this Office. A bamboo, reported to have been brought from India about 1890 by the late Andres E. Moynelo, but from all appearances, a Japanese species, probably *P. bambusoides*. This bamboo was first called to the attention of the office by Mr. Dayton in April of this year when he sent us a large shoot, such as he had been retailing to a Savannah restaurant at twenty-five cents. On examination the plantation was found to consist of good-sized old canes, attaining a height of perhaps 60 feet, and showing its perfect adaptability to the climate of Savannah. The canes on test have shown themselves for certain industrial purposes equal to the imported Japanese forms of *madake*, *P. bambusoides*. (S. C. Stuntz.)

Primula littoniana G.Forrest.(Primulaceae.) 40857. Seeds of Litton's primrose from Talifu, Yunnan, China. Purchased from Dr. C. C. Schneider, Arnold Arboretum. "*P. littoniana*, though by no means the most beautiful of the new hardy Chinese primulas, has an altogether unique character that is bound to carry it into a permanent place in the heart of the primrose lover. The small lilac blossoms, as well as the lilac leaves, are somewhat like those of *P. denticulata*, but here resemblance ceases. Instead of the usual primula umbel, the scape terminates in a long flower spike, set thickly with bloom. The calyces are a rich maroon and the remarkable effect comes when these form a point above a sort of ruff of the lilac blossoms. Small wonder that it fairly dazzled George Forrest, the collector, when he found it massed naturally in the high mountains of China. There the flower stalks sometimes rise to a height of two and a half feet." (H. S. Adams, Garden Magazine, May 1914.)

Pyrus sp.(Malaceae.) 40865-871. Seeds of pears from Talifu, Yunnan, China. Purchased from Dr. C. C. Schneider, Arnold Arboretum. All from cultivated fruits from the Talifu market, of varying sizes and shapes. No information as to quality.

Ziziphus jujuba Miller.(Rhamnaceae.) 40877-878. Jujube fruits from Pinchow, Shensi, and Lingpau, Honan, China. 40877, "A very good quality of jujube, having large and heavy fruits of elongated shape; considered to be the second best in China, the *Ta yuan tsao* of Pai hsiang chen, Shansi, coming first. Chinese name *Chin tsao* and *Fei tsao*, meaning 'Golden jujube' and 'Fat jujube.'" 40878, "A medium

large variety of jujube, of round-flattened shape and of brown-red color. Meat sweet but of loose texture; much used baked in bread and boiled with millet. Chinese name *Ta hong tsao*, meaning 'large red jujube.'"(Frank N. Meyer's introductions and descriptions.)

Ziziphus mistol Griseb.(Rhamnaceae.) 40853. Seeds of the mistol from Guemes, Argentina. Presented by Mr. H. F. Schultz, Director, Agricultural Experiment Station. "A small tree with spiny tortuous branches, subrotund, coriaceous, minutely serrulate leaves, inconspicuous flowers, and small edible drupes with large stones. Introduced as a possible stock for the Chinese jujube, and for comparison with the Brazilian *Jua* (*Ziziphus joazeiro*). Found throughout northern Argentina as far south as the Province of Cordoba."(Schultz.)

NOTES FROM CORRESPONDENTS ABROAD.

Yokohama, Japan, Miss Eliza R. Scidmore writes August 10, 1915. "The nursery man went up in the air when I suggested getting slips from the plum tree by the Forty-seven Ronin's grave. Impossible!! That tree too sacred to let anyone have a hack at it.

"The Giou cherry tree in Kioto quite possible he thinks.

"Many cherry trees at the Arakawa bank are dead and dying. Floods or popularity, the jarring of millions of feet have paralyzed the roots.

"The dog days began a week after I landed, and the rice crop ought to be a tremenduous one.

"The most beautiful sight in Japan is now Mr. Hara's garden at San-no-taui, beyond the Honmokee bathing beach. A narrow valley with a carriage road crossing and then following lotus, lotus, lotus! Pink and white, very tall, in full flower, beautifully kept. Like the iris gardens, only the iris has not those beautiful big leaves flopping up and down. I never imagined anything so lovely.

"I ran down the morning glory industry for you last week--spent a mosquito night at the hotel in Nyeno park, and at 5 a.m. motored out beyond Kameido, where the Iriya gardeners were driven by the floods six years ago. They still grow them--acres of pots--but send them into the city for sale. There are no show gardens and places to sit and look at benches, etc., full of rare ones. All that is over. Too far out now for people to go at sunrise and wander from garden to garden as at Iriya.

"You would think yourself in Berlin now to ride into the heart of Tokyo on elevated tracks and descend by cement staircases and tiled tunnels to the great domed *bahnhof*. I liked it better the old way."

Mokanshan, Chekiang Province, China, Mr. Frank N. Meyer writes Aug. 5, 1915. "Concerning this bamboo, *Phyllostachys pubescens*, I can say this: The 'Mao tsoh' delights in sheltered situations on mountain and hill-slopes; it wants a rich, porous clayey soil to reach greatest perfection. In this latitude, 31°, it seems to thrive best at elevations between 1000 and 2000 feet above sea-level. The height of canes varies from about 20 feet, on poor, exposed places, to about 80 feet in rich, moist gullies, in diameter of stem from 2 inches to 5 inches, and in circumference of stem from 6 inches to 16 inches. The canes sell locally at 4 cash per catty (=about $\frac{1}{4}$ of an American cent for $1\frac{1}{2}$ lb.). A cane often weighs up to 80 catties but the average is probably about 30 catties. At Dongsi, Mr. Kennedy informed me, they receive about 20 Chinese copper cents for a cane of about 40 ft. long; (which is about 8 cents U. S. gold, but the rate of exchange influences prices considerably, when American currency is used). As regards cutting of this bamboo, the best time is from the end of October until the beginning of February. Concerning periodical cutting, the following advices were obtained. Do *not* cut canes less than two seasons old, as it weakens the plants very much and the canes themselves do not last long, being not fully mature. Do not allow canes to stay on the ground for longer than 7 years, as the wood becomes too hard and too brittle to handle, except for exceptional purposes. The ideal is to cut in a bamboo grove every two years all of the canes that are three years old and over, but should the grove not be very vigorous, be careful in not removing too many canes and especially no young ones. Canes of one season's growth should, at the approach of winter, have their tops cut out, so as to minimize the danger of such canes being broken by the snows and the storms of the cold season; these tops are in general 5-10 feet long, depending upon the length of the cane; they are used, when cut up and arranged suitably, as brooms and they are very lasting, cheap and efficient and of special value in farm-yards, in sweeping grains and seeds together on threshing floors. When transplanting this bamboo or when starting a new grove, the aim should be to obtain young, strong rhizomes of considerable length, with as many roots attached as possible, and to transplant them from the middle of February until the end of March; leave no large piece of cane

attached to the rhizome. (This is Chinese advice of course, because the Chinese here do not know the success one can obtain with bamboos, when growing them with confined roots!) As regards the monetary returns per acre per year, this we find a very hard matter to get cleared up. One fellow said that a neighbor of his had sixty mow of land, (about 10 acres) with *Mao tsoh* and after having let them grow for four years, he received last winter $200 Mex. for the lot, that is, for every cane that was two years old. He had to pay, however, 10% taxes, so he got $180.00 Mex. clear money; which is $18.00 Mex. per acre for 4 years, or $4.50 Mex. per acre per year. And his bamboos were very fine indeed, added our informant. This is certainly a small return for a crop, according to an American point of view, but then - these bamboos grow on mountain slopes where it is very hard to grow other crops, with the exception of tea, and they need very little looking after, while the cut-off tops and the culm sheaths (for packing) bring in an additional small income.

"Here are a few fundamentals of working bamboos: never split canes which are perfectly dried out, always have your canes as moist as possible. Straighten your canes by means of a hot flame and bend gently, while applying hot pieces of cloth to the stems. When wanting curves and abrupt bends, saw out a piece and bend above a hot flame. Employ sharp instruments of hard steel. Split bamboos from top to bottom.

"When wanting the partitions of a large cane pierced through, so as to use it for a water pipe, take a thin, hard cane and ram it through.

"If building long irrigation pipes, fit the top end of one cane into the base end of the other, and take fiber with clay to make the joints tight; they do not stand a great pressure, however. Later on, when having seen more, I may be able to say more but now I think I am safe in saying this:

"Bamboo culture in the Gulf sections of our Southern States and in parts of the Pacific Coast States will become successful within the next few generations. It probably will prove to be quite remunerative when taken up by industrial schools and as a home industry. One of the quickest ways to make bamboo culture popular, would be by having a travelling exhibit of bamboo ware and photos, etc., and showing such things to people in those sections of the U. S. where bamboo groves could be established."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen Investigations.
Allen M. Groves, Nathan Menderson, and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
———————— In charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Date of Issue: Sept. 28, 1915.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 111-2. **July-August 1915.**

Genera Represented in this Number.

Aleurites	40977	Mangifera	40911
Anacardium	40987		40920-921
Brassica	41031		40983
Canarium	40926	Moringa	40913
	41001	Persea	40912
Citrus	40917		40978-982
Cordia	40988	Phaseolus	40925
Cymbopogon	40896	Polakowskia	41008
Dimocarpus	41053	Pouteria	41003
Dolichos	40903	Prunus	40997-998
Enterolobium	40995	Psidium	40993
Litchi	40915	Saccharum	40989
		Ulmus	40898

Plates:

Litchi chinensis.
Site of New Field Station at Buena Vista, Florida.
Actinidia chinensis, First Fruit Produced in America.
Quetta nectarine, natural size.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Aleurites moluccana (L.) Willd. (Euphorbiaceae.) 40977. Seeds of the candlenut tree from Manila, Philippine Islands. Presented by Bureau of Agriculture. "A handsome tree with spreading branches, alternate, lobed, pubescent leaves of a pale color, rounded or cordate at the base, with two glands at the top of the petiole. Flowers small, white, in terminal lax cymes; fruit fleshy, coriaceous, globose, with four shallow furrows; seeds one or two, rugose, gibbous. The candlenut tree is widely spread over Polynesia, a small part of Malaysia, and the Philippine Islands. Throughout Polynesia the nuts, strung on coconut-leaflet ribs, serve the natives for candles to light their houses. In Hawaii they are roasted, chopped up, mixed with seaweed, and served at native feasts as a relish. They yield an oil which is very fluid, of an amber color, without smell, insoluble in alcohol, readily saponifiable, and quickly drying. This oil is a mild cathartic, acting in the same manner as castor oil, but causing no nausea nor griping, and having the further advantage of a nutty flavor and of being more prompt in its effects." (Safford, Useful Plants of Guam.)

Anacardium excelsum (Bert. & Balb.)Skeels. (Anacardiaceae.) 40987. Seeds of *nariz* from Trinidad, Santa Clara Province, Cuba. "A magnificent tree, native of South America. It is very rare here in Cuba but there are four or five fine old specimens beside the cart road from Casilda to Trinidad, and it is from these fine specimens (which have been noted by Roig and de la Maza, Flora de Cuba, p. 131) that these seeds were obtained. The *nariz* grows to 60 or 65 feet in height, forming an erect but rather broad, compact head of deep green foliage. As a shade and ornamental tree it should have considerable value. The leaves are entire or nearly so, upon stout petioles one-half to one inch long, the blades obovate, oblanceolate or spatulate, six to eighteen inches long, two and one-half to six inches broad, the apex obtuse to subacute, the base cuneate-attenuate, the surface smooth and deep green above, somewhat paler beneath, the venation raised below. The fruits ripen principally in August; they are dark brown, about an inch long, reniform and flattened, shaped somewhat like a nose, whence the name *nariz*. Unlike the cashew, the fruit stalk is not large and swollen, but is inconspicuous. The seeds are not considered edible. While this tree appears to have no particular economic value, it is worthy of trial as an ornamental, and it would also be of interest to test it as a stock for its relative, the mango."(Popenoe's introduction.)

Brassica chinensis Jusl. (Brassicaceae.) 41031. Seeds of Pakchoi or Korean cabbage from Songdo, Korea. Presented by Rev. C. H. Deal, Anglo-Korean School. "Korean cabbage. I think this is strictly a Korean article, as I have never met with it anywhere else. It grows very much like celery but with leaves very much like a turnip or mustard leaf. The stems are stocky and bleach beautifully. It is used here for making a kind of pickle called Kimchi. The natives call the cabbage Pachoo which would be a good name in case you have not already introduced the seed under another name. The seeds are planted in the fall, about September, in hills about fifteen inches apart each way and thinned out to one stalk to a hill. It is not gathered in until after frost, just before the first heavy freeze. It takes a good deal of water and rich land and plenty of fertilizer."(Deal.)

Canarium amboinense Hochr.(Burseraceae.) 41001. Seeds from Buitenzorg, Java. Presented by the Director, Botanic Garden. "A burseraceous tree 80 to 90 feet high, closely related to *C. moluccana* but differing in the nearly smooth, oblong fruit, that of *C. moluccana* being very rough and very much more elongate. This tree branches about 25 feet from the ground, trunk about eight feet in circumference; possesses large arching prop-roots at the base; bark smooth and white; crown umbrella-shaped."(Hochreutiner, Plantae Bogoriensis Exsiccatae, p. 55.)

Canarium ovatum Engler.(Burseraceae.)40926. Seeds of Pili nut from Manila, Philippine Islands. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture. "Because of the easy digestibility of these nuts, they are being used in increasing quantities for the preparation of an infant food, the excess of oil being removed and the nuts ground to a paste. These nuts have been gathered by one of our representatives residing on the island of Catanduanes and are fresh stock, hulled by the cold-water process."(Adn. Hernandez.)

Citrus grandis (L.) Osbeck. (Rutaceae.) 40917. Seeds of pomelo from Paramaribo, Dutch Guiana. Presented by Dr. J. A. Samuels, who secured it from Mr. Bueno de Mesquita. "Alamoen. A new type of citrus fruit. As the fruit is apparently a new type of grapefruit, it may possibly be resistant to the canker and should be made a subject of investigation as soon as possible."(D.G. Fairchild.) This fruit, which is most likely the largest variety of the Citrus, is called Guidieon-apple in Surinam. According to

Mr. Mesquita, there is a difference between *Lamoen* (in English *Alomoes*) and *Limoen*, or *Citrus limonum* Risso. The Dutch name of *Alomoes* is *Pompelmoes* and this is not cultivated on a large scale in Surinam. They are planted in the house gardens in the city and in the country. The fruit has not yet been selected and has not been used for industrial purposes." (Samuels.)

Cordia alba (Jacq.) Roem. & Schult. (Boraginaceae.) 40988. Seeds from Trinidad, Santa Clara Province, Cuba. "*Ateje*. A large shrub, 15 to 18 feet high, common along the eastern edge of the valley of San Luis. It is bushy, branching close to the ground and sending up long stiff shoots well furnished with dark green foliage. The leaves are alternate, obovate to ovate-elliptical, three to four inches long, with entire margin and the surface covered with short, bristly hairs; petioles about an inch long, terete. The flowers, which are pale yellow and about one-half inch in diameter, are borne in broad, flat-topped corymbs sometimes a foot across. The oblong-obovate fruits are half an inch in length and pearly white when ripe, enclosing a single large seed. It is, apparently, a good meliferous plant, and of considerable ornamental value. For trial in south Florida and California." (Popenoe.)

Cymbopogon coloratus (Hook.) Stapf. (Poaceae.) 40896. Seeds of lemon grass from Suva, Fiji Islands. Presented by Mr. C. H. Knowles, Superintendent of Agriculture, Nasinu Experiment Station. "This grass is growing well on sloping ground, the soil of which is brownish red, not very good in quality. The ground was first ploughed and harrowed, and young plants from a seed-bed set out at distances of three feet. The space between the young plants was kept clean by weeding and the plants soon grew and covered the ground. Plants may be set out any time during wet weather, but from September to December is best. Under normal conditions the grass flowers about April or May, when about four feet high. After the grass has been cut it flowers irregularly during the year. The best time to cut appears to be when the grass is from three to four feet high but before it is heavily in flower. Subsequent cuttings may be made whenever the grass is over three feet high. Two cuttings may be depended on, while three may be made unless dry weather sets in for some time. The young grass is richer in oil than the older grass, but the total yield per acre obtained in the same time is less." (Bulletin No. 6, Fiji Department of Agriculture.)

A row of Litchi trees (*Litchi chinensis*) in Canton, China.

The dykes which separate the rice fields in South China are often planted with fruit trees and a favorite tree for these situations is the Litchi (otherwise spelled Leitchee, Leichee, Leitchi, or Lichee). It appears to be able to stand light frosts when once established but when young it is easily killed by freezing temperatures. A single tree of the Litchi has fruited at Santa Barbara, California, and young trees are growing at several places in Florida. Photograph by G. Weidman Groff of the Canton Christian College.

RECEIVED
FEB 28 1916
Division of Forestry
University of California

Baskets of Fresh Litchi Fruits in Canton, China.

The Chinese litchi (*Litchi chinensis*) is already familiar to the American public but few know that it is not a real nut but a dried fruit or that there are scores of different varieties of it. They are among the most delicate flavored of all fruits, having an almost perfumed character about them. The trees are grown like the one shown in the cut along the dykes which divide the rice fields from the canals. Photograph by G. Weidman Groff of the Canton Christian College.

Dimocarpus longan Lour.(Sapindaceae.) 41053. Seeds received from Little River, Florida. Presented by Mr. Charles Simpson. "The *longan* tree is likewise a native of Southern China, where it is cultivated for the sake of its fruit. Its leaves have generally five pairs of leaflets much resembling those of the *litchi*, but it is readily distinguished by its flowers having a deeply five-parted calyx. The *longan* is a smaller fruit than the *litchi*, varying from an inch to an inch and a half in diameter, and quite round, with a nearly smooth, brittle skin of a yellowish-brown color. It contains a similar semi-trans-parent pulp of an agreeable sweet or subacid flavour, and is largely sold in the markets." (Treasury of Botany, vol.2, p.784.) To be tested as a stock for *Litchi chinensis*.

Dolichos lablab L.(Fabaceae.)40903. Seeds from Peking, China. "A brown-seeded variety of hyacinth bean, much used by the Chinese as a vegetable, preferably sliced green and only slightly cooked. These hyacinth beans are much grown as a home vegetable along fences of kaoling stems and even in between maize. They are also quite decorative. Chinese name *Ching pien doh*, meaning 'Green flat bean'."(Meyer's introduction.)

Enterolobium cyclocarpum (Jacq.) Griseb. (Mimosaceae.) 40995. Seeds from Santiago de las Vegas, Cuba. Collected by Mr. Wilson Popenoe, of this Bureau. "*Oreja de judio*. A fine leguminous tree extensively used in this region as a shade tree along avenues and carreteras. Of the four or five different species used on the rock road from Santiago de las Vegas to Habana this is certainly one of the best, growing to a considerable height and branching to form a symmetrical, rounded head of deep green foliage, giving a fairly dense shade and presenting an attractive appearance. While it has already been planted in Florida, I know of no avenues of it in that state, and it might advantageously be propagated at Miami, I believe, with the intention of testing it as an avenue tree."(Popenoe.)

Litchi chinensis Sonnerat.(Sapindaceae.)40915. Seeds from Canton, China. Presented by Mr. G. Weidman Groff, Canton Christian College, through Mr. F. E. Shamel. "*Haak-ip* litchi. The litchi seems to do best in about this latitude. It succeeds somewhat north and south of this but I should say cannot stand much frost. We have a light frost here almost every year but not heavy enough to do much damage. It seems to do best on dykes of low land where its roots can always secure all the water needed and where they are

even subject to submersion. In some places they grow it on high land but not nearly so successfully. I have never seen a budded or grafted litchi tree, and I understand it is never done. Litchi trees are either inarched or layered, the latter being the more common and the most successful. If inarched it is on litchi stock. The common practice in inarching is to use the *Loh Mai Chi* variety for scions and *San Chi* variety for stock. The seeds of the various varieties vary greatly in vitality. I am told that there is absolutely no success with seedlings, though seeds of certain varieties germinate quite readily. This variety, the *Haak-ip* is one of the most popular and is now on the market. The seed of this variety germinates quite readily though not so well as the *San Chi*."(Groff.) See Plate and Notes from foreign correspondent.

Mangifera indica L.(Anacardiaceae.) Mango budwood collected in Cuba by Mr. Wilson Popenoe, of this Bureau. 40911. "Jovellanos, Matanzas Province. *Luisa mango*. A seedling of the Philippine race. Luisa is a typical Philippine mango, long, slender, and pointed at the apex, varying somewhat in form and size. A good specimen will weigh eight to ten ounces. The color is lemon yellow, as in others of the type. The fruits are not yet ripe, so I have not had an opportunity to test the quality, but according to Prof. Earle it is excellent. Seedlings of the Philippine race are frequently rather unproductive, although the fruits are produced in clusters of two or three to about ten, and in a good season an enormous crop may be produced. Because of its excellent flavor and quality, this variety should be given a trial at Miami." "Cienfuegos. *Manga mamey*. A fine seedling type, found only in the Quinta Aviles, so far as known. In general form it is broadly cordate, very short (just about as broad as long), slightly compressed laterally, the base flattened and very slightly oblique, the apex with a suggestion of a beak. In weight it averages eight to 12 ounces. The stem is inserted in a shallow, narrow, almost regular cavity. The surface is smooth, greenish orange-yellow to orange-yellow in color, blushed around the base with reddish salmon. The dots are large and conspicuous, a distinguishing feature of the type as frequently with other members of the mango group. The skin is thick and very tough, the flesh bright yellow-orange, meaty, moderately juicy, with very little aroma. The flavor is acid, pleasant, fairly spicy; fiber not very objectionable except around the ventral edge of seed, where it is long and fine. The seed is long, rather thick, with two to five embryos in the speci-

mens examined, and an exceedingly hard, woody endocarp. In season this type agrees with *Chino* being early to mid-season in ripening. While somewhat more fibrous than the best Indian varieties grown in Florida, it is far above the average Cuban seedling in quality and freedom from fiber, and is here considered a very choice mango. The trees appear to be productive. For trial in south Florida." (Popenoe.) 40921. "Cienfuegos. *Mango Chino*. This is one of the largest and best seedling types in Cuba. In general form *Chino* is broadly cordate, plump, usually somewhat oblique at the base and rounded at the apex. It weighs 10 to 16 ounces. The stem is inserted in a shallow, somewhat irregular cavity. The surface is smooth, greenish yellow to dull cream yellow in color, overspread or blushed around the base with carmine. The skin is very thick and tough, making the fruit an excellent shipper. The flesh is deep yellow in color, orange yellow toward the seed, of very firm and meaty texture, juicy, and with a very faint but pleasant aroma. The fiber is more abundant than in our best India varieties but much less so than in the average Cuban seedling; it is long at the ventral edge of the seed, but comparatively short elsewhere. The flavor is rich, spicy, and very pleasant, the seed oval, rather thin, and not objectionably large. It usually contains four to six embryos. *Chino* is rather early in season, and the trees seem to be productive." (Popenoe.) 40983. "Santiago de Cuba. *Biscochuelo mango*. This is probably the best type of mango grown in the vicinity of Santiago de Cuba, and excepting the *Filipino*, one of the very best in the island. It is quite common here, and very abundant on the markets, where the fruits are sold at $2 per hundred. *Biscochuelo* is a fruit of rather unique form differing from all others I have seen in Cuba. It is oval to subreniform, decidedly oblique, the left shoulder rounded to very broad and marked by a deep suture which extends some distance down the ventral side of the fruit, the right shoulder usually falling abruptly. The apex is rather sharp and sometimes almost beaked. In cross section the fruit is broadly oval. The weight is from eight to 14 ounces. The general color, when the fruit is fully ripe, is clear light orange, but as seen in the market they are frequently tinged with green. The skin is thick and tough, the flesh bright orange yellow, firm and meaty, with a faint but pleasant aroma and very little fiber for a seedling type. The flavor is sweet even when the fruit is still quite hard, and when fully ripe it is very pleasant. The seed is reniform in outline, with long fiber on the ventral edge and short stiff fibers elsewhere, the em-

bryos one to five in number. Most of the specimens examined were polyembryonic. Seems worthy of trial in south Florida. The tree fruits well in this region."(Popenoe,)

Moringa oleifera Lamarck. (Moringaceae.) 40913. Seeds from Cuba. Collected by Mr. Wilson Popenoe, of this Bureau. "*Palo blanco*. A small ornamental tree which is planted in the gardens of the region. As commonly seen here it is a tree of about 15 or 20 feet in height, erect, and of very attractive appearance. The leaves are pinnately compound, often nearly a foot in length, of pleasing light green color, with opposite, shortly petiolulate obovate-elliptic leaflets rarely over half an inch long. The flowers are borne on axillary panicles six to eight inches long, they are white, about an inch long, and faintly fragrant. As they are produced in great abundance they make the tree effective as an ornamental. The slender triangular seed pods are often a foot in length; when ripe they dehisce and scatter the ground with seeds. *Palo blanco* is considered to be an antidote for manchineel (*Hippomane mancinella*) poisoning. As an ornamental it seems worthy of trial in south Florida and possibly also in southern California, in regions protected from severe frosts." (Popenoe.)

Persea americana Miller. (Lauraceae.) From Cuba. Budwood collected by Mr. Wilson Popenoe, of this Bureau. 40912. "Jovellanos, Matanzas Province. *Luisa avocado*. The parent tree of this variety is growing in the garden at the Casa Vivienda, on the Nueva Luisa sugar estate. It is a large seedling, apparently 25 years old at least. Its particular value lies in the fact that the fruit is said to ripen in October, after nearly all the avocados are gone. The fruits, which are only about three inches long at present, are broadly obovate in form, with no indication of a neck, the skin light green when ripe and very thick. Judging from the immature fruit, the seed cavity is not large and the seed fits in it snugly. According to the gardener who was in charge of the place, the fruit is of excellent quality, with a rich flavor and no fiber. The tree, which stands among a lot of others beside a small stream which trickles through the garden, is bearing a good crop of fruit. The only late avocado at present grown commercially in south Florida is the *Trapp*. It seems worth while to try out other varieties which ripen late in the season, and *Luisa* has been obtained with this view. The season is earlier here than in Florida, generally speaking, and an avocado which ripens here in October may hang on the tree

The site of the new Plant Introduction Field Station at Miami (Buena Vista), Florida before any improvements whatever had been made upon it. A complete list of the native flowering plants to be found upon the site has been made by Prof. Chas. T. Simpson and a small area has been set aside on which will be maintained as long as feasible a sample of the original flora. The most conspicuous plants in the photograph are the Cuban Pine (*Pinus caribaea*) and the Palmetto (*Inodes* (*Sabal*) *etonia*). Mr. Fairchild and Mr. Simmonds are standing at the left.

The Miami oolite rock formation, which underlies the new Miami Plant Introduction Field Station. When these large holes in the rock are filled with good soil and a sufficient layer of humus is maintained over the rock surface tree roots seem to find very congenial conditions for growth there.

in Florida until even later than this, because of the cool autumn weather." (Popenoe.) 40978. "Placetas, Santa Clara Province. *Bartlett avocado*. A rather remarkable variety growing in the garden of Dr. Alberto Bartlett of this town. It is said to bear two crops a year; the first crop is early, and is now ripening, the second crop commences in December and the last fruit was eaten this year on May 8th. In form this fruit is broadly pyriform, and in size about four inches long by three inches in thickness. The color is bright green, the surface smooth. The skin is rather thin, scarcely over one mm. in thickness. The flesh is creamy yellow near the seed, changing to pale green near the skin, of good texture and said to be of good quality, though not excellent. The seed is about the average size, but not objectionably large; the seed coats are rather thick and loose, but I found no specimens in which the seed rattled in the cavity. The tree is evidently very productive, judging by the present crop. It is growing in a very favorable situtation, however, and receives a good deal of fertilizer. The fruit is attractive in appearance, and seems well worthy of a trial in south Florida." (Popenoe.) 40979. "Placetas, Santa Clara Province. *Don Carlos avocado*. A small variety, said to be of exceptionally choice quality, from the Quinta Aguas Azules of Dona Serafina Wilson, Viuda de Bartlett, near Guadalupe, about 15 miles from Placetas. This fruit is almost perfectly round in form, and of light yellowish green color. The skin is thick, the flesh of fine, oily texture, and the seed very small in comparison to the size of the fruit. The tree is bearing an excellent crop and can probably be considered productive. It ripens its fruit from August to October, and is not, therefore, a very late variety, but because of its good quality it is considered worthy of a trial in south Florida. It was the favorite fruit of Don Carlos Bartlett, the former owner of the Quinta Aguas Azules, and has been named after him." (Popenoe.) 40980. "Placetas, Santa Clara Province. *Guadalupe avocado*. A late variety from the Quinta of Joaquin Wilson at Guadalupe, about 15 miles from Placetas. This is a broadly pyriform fruit, narrowed at the base but not noticeably 'necked' and somewhat oblique at the apex. It will probably weigh 12 to 14 ounces when ripe. The color is green, sometimes mottled with maroon; the skin is rather thin, about one mm. in thickness. The flesh, which seems to be entirely free from fiber, is said to be of good flavor. The seed is of about the average size, not objectionably large, and apparently tight in the cavity. This tree produces the latest fruits of any on the Wilson farm, but the crop does

not all ripen late, and only a few fruits hang on until February. At the present time there are fruits in various stages of growth upon the tree, some almost fully grown, others still quite small. Joaquin Wilson claims that he has picked ripe fruit from this tree during a large portion of the year. It does not appear to be a very heavy bearer, however. For trial at Miami, Florida." (Popenoe.) 40981. "Placetas, Santa Clara Province. *Merced avocado*. The latest variety growing in the Quinta Aguas Azules of Dona Serafina Wilson, Viuda de Bartlett, at Guadalupe, about 15 miles from Placetas. The fruit is said to remain on the tree until February. It is broadly pyriform, very similar to *Pollock* in shape, but probably not over one pound in weight, judging by its present size. The color when ripe is said to be green, and the quality excellent. The tree is old and in poor condition; it is not bearing a good crop this season, but might fruit more heavily under favorable conditions. For trial in south Florida." (Popenoe.) 40982. "Placetas, Santa Clara Province. *Wilson avocado*. A late variety, said to be of unusally good quality, from the Quinta of Sr. Joaquin Wilson at Guadalupe, about 15 miles from Placetas. This is a rather small fruit, probably not over 8 to 10 ounces in weight, round to very broadly oval in form, usually somewhat oblique at the apical end. The color, when ripe, is said to be very light green. The skin is two mm. in thickness. The flesh is perfectly free from fiber, and said to be of unusually fine texture and rich flavor. The seed is very small in proportion to the size of the fruit. According to Sr. Wilson, after whom the variety is named, it ripens about Christmas. The tree is carrying an excellent crop and seems to be all that could be desired in regard to productiveness. While rather small in size, this seems to be a valuable fruit, and should be tried in southern Florida." (Popenoe.)

Phaseolus lunatus L. (Fabaceae.) 40925. Seeds from Marseilles, France. Presented by Dr. E. Heckel, Director, Colonial Museum. "*Kalamaka* of the Malagasies. Cape beans have taken the second place among the agricultural products of Madagascar in exportation. In commerce, this large bean bears different names, *haricot d'Orleans*, *haricot de Lima*, *de Paragüe*, etc. It has been known in Madagascar for a very long time, and it is mentioned in the accounts of voyages before the 17th century. Its culture is practiced almost exclusively in the provinces of Tulèar and Morondava, situated at the southwest of the island. The alluvial soils of the deltas of this region suit it admira-

ably, particularly those which are rich in micaceous elements. These are ordinarily recovered from *bararata*, large reeds (*Phragmites communis?*) attaining four meters in height, and submerged during the winter. The soil is prepared by superficial working. This preparation commences in March and April, as soon as the waters subside. The bararatas (reeds) are cut and burned; they shoot again, but the young shoots are broken down with a stick and this encroaching vegetation disappears. The seeds are planted in holes from three to four meters apart in March and April. Harvest takes place from September to December. Almost all of the crops of Cape beans are irrigated. Sells in Marseilles for 65 frances per 100 kilos." (Heckel.)

Polakowskia tacaco Pittier. (Cucurbitaceae.) 41008. Seeds of *tacaco* from Costa Rica. Presented by Mr. Carlos Wercklè, at the request of Mr. Van der Laat, Director, Department of Agriculture. "A cucurbitaceous plant, the fruit of which is used as a green vegetable. It is a near relative to the chayote, but the fruit is smaller, fusiform, set with stiff spines at the base and of quite a distinct taste. It is one of the primitive foods of the native Indians of Costa Rica, where it grows wild in fresh, shady places of the temperate region, and its use as a vegetable has been readily adopted by the Spanish Costa Ricans. Nowadays the plant is at least semi-cultivated on the central plateau. To grow it, a whole mature fruit is set in a rich, loose leaf mould, with the spiny end up and almost showing at the surface. (They do not sprout if planted in common garden earth.) The vines spread on the ground or on low bushes or supports. The fruits, which are about two and one-half inches long and one and one-half inches broad, hang from short peduncles and are picked when still green. After taking away the basal spines they are boiled in water, either whole or cut into small pieces, or pickled, or made into preserves. They are also a favorite addition to the native vegetable soups." (H. Pittier.)

Pouteria caimito (Ruiz & Pav.)Radlkofer. (Sapotaceae.) 41003. Seeds of *abiu* from Lavras, Minas, Brazil. Presented by Mr. Benjamin H. Hunnicutt, Escola Agricola de Lavras. "A timber tree with edible fruits. The fruit is a beautiful golden yellow and is the shape of the fruit of the *limao do matto*, *Rheedia brasiliensis*. The fruit is somewhat sticky but of a delicious flavor. The one we have on our place is a beautiful bush at present and would do very well as an ornamental plant. It is found in the states of Espirito Santo, S. Paulo and Minas Geraes." (Hunnicutt.)

Prunus maximowiczii Rupr. (Amygdalaceae.) 40997. Seeds of Maximowicz's cherry from Jamaica Plain, Massachusetts. Presented by Professor C. S. Sargent, Arnold Arboretum. "A tree about 25 feet high, with horizontal branches. Leaves obovate, about one and one-half inches long, somewhat coarsely toothed, nearly glabrous; petioles slender, about one-half inch long. Flowers white, on slender hairy peduncles, one or two on each flowering shoot. Fruit crimson, the size of small peas. Japan." (Kew Bulletin, New Garden Plants, 1903.)

Prunus sargentii Rehder. (Amygdalaceae.) 40998. Seeds of Sargent's cherry from Jamaica Plain, Massachusetts. Presented by Professor C. S. Sargent, Arnold Arboretum. "A species which has been confused with *P. pseudo-cerasus* from which it differs by having all its parts glabrous. It is nearest allied to *P. serrulata*, differing by having sessile umbels and more coarsely toothed leaves. Japan." (Kew Bulletin, New Garden Plants, 1909.)

Psidium guayabita A. Richard. (Myrtaceae.) 40993. Seeds of guayabita from Santiago de las Vegas, Cuba. Presented by Mr. Juan T. Roig, Botanist, Agricultural Experiment Station. "This is a species peculiar to the western portion of Pinar del Rio, where it is called *guayabita del Pinar*. The fruit is edible but not very valuable. A very popular aromatic liquor is prepared from the fruit and there is a factory in Pinar del Rio which has patented the product with the name of *Licor de guayabita del Pinar*." (Roig.)

Saccharum ciliare Anderss. (Poaceae.) 40989. Seeds of elephant grass from St. Kitts, British West Indies. Presented by Mr. F. R. Shepherd, Curator, Botanic Station. "It is the *sara* of the classic authors of India, and is met with throughout the plains and lower hills and distributed to China. In the Panjáb it often covers large tracts of country and is frequently planted in lines or dividing hedges, especially in low-lying localities subject to periodic inundation. Sir William Jones says 'This beautiful and superb grass is highly celebrated in the Puránas, the Indian God of War having been born in a grove of it, which burst into flame; the gods gave notice of his birth to the nymph of the Pleiades, who descended and suckled the child thence named Carticeya. The *casa* (*kasa* or *kans*) vulgarly *casia* (*S. spontaneum*) has a shorter culm, leaves much narrower, longer and thicker hairs, but a smaller panicle, less compound, without the purplish tints of the *sara*; it is often described with praise by the

Hindu poets for the whiteness of its blossoms, which give a large plain, at some distance, the appearance of a broad river. Both plants are extremely useful to the Indians, who harden the internodal parts of the culm, cut them into implements for writing on their polished paper. From the munji, or culm, of the *sara* was made the maunji, or holy thread, ordained by Menu to form the sacerdotal girdle, in preference even to the cusa-grass.' Munji fiber is obtained from the leaf-sheaths; the blades are the sar or sara used in thatching houses and as a paper material; the contained flowering stem is the bind or vind; the panicle or flowering stem is the sirki, til or thili, used in thatching boats, carts, etc.; sentha or kana is the lower, stronger portion of the flowering stem, used in the manufacture of chairs, stools, tables, baskets and screens; and tilak, tilon or ghua are names that denote the flowers. Some of these names, such as munji and sara, have been supposed to denote the products of different species, instead of different parts of one and the same plant, hence has originated much of the confusion that prevails. Sara is used in paper-making and munji as a textile fibre. The much prized munji is strong, elastic and has a wonderful power of enduring moisture without decaying. It is extensively employed in the manufacture of cordage, ropes, the famed Delhi mats, and in the preparation of baskets, etc. Munji mats are reported to be proof against white ants, but are hard on shoe leather, harsh to the foot and fatiguing when walked on for any length of time. These are largely produced in Allahabad, Agra, Delhi, and are traded in all over India, and within recent years have begun to find their way to Europe. In the early spring the old grass is often fired when shortly after a crop of young leaves is produced from the stools, which is much valued as fodder." (Watt's Commercial Products of India, p. 929.)

Ulmus pumila L. (Ulmaceae.) 40898. Seeds from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "The Chinese elm, used all over northern China and Manchuria as an avenue, shade and timber tree. Resists droughts, extremes of heat and cold, and neglect remarkably well; will be a good shade tree for the semi-arid northern regions of the United States. The Chinese carts are mainly constructed from the wood of this tree. Has proven itself to be adapted as an ornamental tree over a very extended territory in the United States." (Meyer.)

NOTES FROM CORRESPONDENTS ABROAD.

China, Canton. Mr. F. D. Cheshire, reports under date of July 8, 1915, on the lichee: The lichee, one of the most widely known fruits throughout China, is produced in South China, chiefly in the provinces of Fukien and Kwangtung; it is also produced in Szechuan. A small quantity is grown in other southern provinces, but none whatever in the north. It is said that lichees grown in other than the three provinces named are inferior in quality and almost unfit for edible purposes.

For the sake of accuracy, this report will be confined to the lichees grown only in Kwangtung Province.

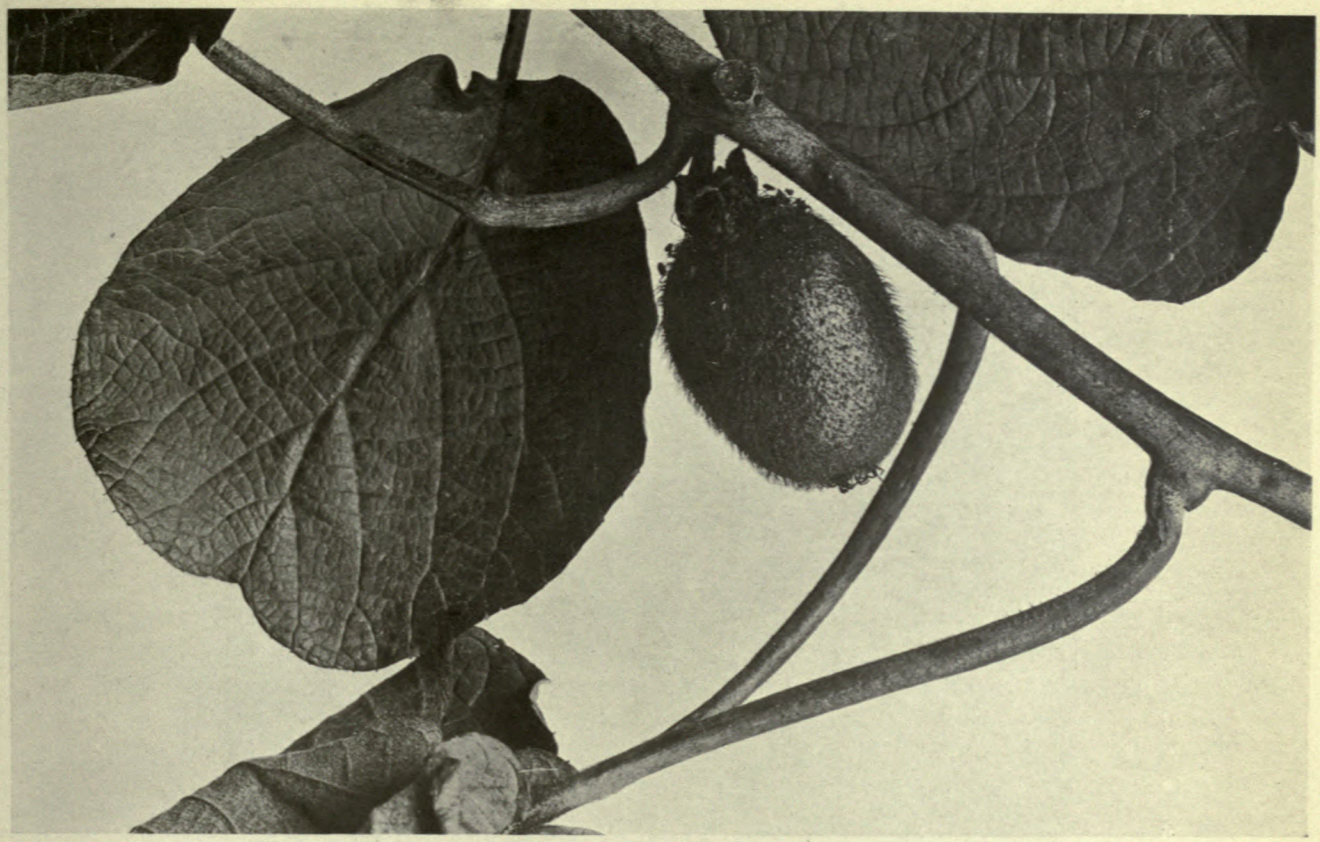
The principal lichee producing districts in Kwangtung Province are Namhoi, Pun Yu, Tsang Shing, and Tung Kun. Some lichees are grown in the Heungshan, Shuntak, and Samshui districts, and while they are produced in abundance in the Yeung Kong and Shui Tung districts, they are of a very inferior quality.

The fruit of the lichee tree, when plucked, rapidly deteriorates, and can be kept in its original state for only three days at most. A plan has been adopted for preserving the fruit by storing it in bamboo after sprinkling with a weak salt solution and sealing both end of the bamboo with clay. In this manner the fruit remains fresh for a period of about two weeks, allowing of its being exported to Shanghai and Peking, and ports on the Yangtsze River.

Dried lichees are very popular in foreign countries. The fruit is dried in two ways,- by sun and by fire. The sun-dried lichee, when under the drying process, is likely to deteriorate and, consequently, it commands a better price; besides it has a finer flavor than the fire-dried fruit. There are but two or three species of the lichee which are suitable for drying purposes, viz., the *no-maichi*, the *kwai-mi*, and the *wai-chi*.

The purchase of lichees by the wholesale dealers from the producers is largely one of speculation, the former bargaining with the latter for the fruit during the months of April and May, while the trees are yet in blossom, a certain amount being agreed upon for each tree. In the event of the tree being unfruitful, the purchaser must suffer the consequences, and vice versa.

The actual quantity of fruit produced annually is a difficult matter to ascertain accurately, but from information received from the lichee producers, the total amount of lichees annually produced in the Kwangtung Province is estimated at 1,500,000 pounds.



The Yang Taw vine (*Actinidia chinensis*) bearing a single immature fruit; the first to be produced in America.

The vine was trained over the porch of a private house at Chico, California, and produced a number of fruits.

When trained high allowing only a single stem to grow and form a trunk and the leafy branches to spread out over a pergola this rank growing vine produces a very satisfactory shade.

This fruit never reached maturity, so that at present, we are unable to corroborate the statements of travellers in China who claim the fruit is of considerable value for jams and preserves. Photograph by R. L. Beagles, October 1915.

The Quetta Nectarine(S.P.I. No.18235).

The seeds were collected from the best nectarine trees in Quetta, Baluchistan, at an altitude of 6000 feet by Lieutenant W. L. Maxwell of the 127th Baluchistan Light Infantry. The large size and good color of this variety together with its excellent flavor make it very promising. Photographed at Chico, Calif., by R. L. Beagles from the first fruits to ripen in this country.

The selection of suitable soil for the planting of lichee trees is most essential. Alluvial soil lying along the banks of fresh water streams is to be preferred. A soil composed of sand and mud in about equal proportions and about six feet above water is considered ideal. The lichee tree is extremely sensitive to cold weather and thrives best in warm climates. Its two deadliest enemies are salt water and cold, and for this reason it is difficult to grow lichee trees even in South China.

An abundance of manure is essential if the tree would flourish. In winter the young trees must be protected from the cold by wrapping the trunks with straw and covering the base of the tree with a mixture of hay and mud, and this process must be continued until the trees have reached the age of forty to fifty years, when it may be dispensed with.

The season for planting the lichee tree is in the spring. The seed or kernel from the fruit is placed in the ground and protected with manure and mud. When the tree is one year of age, it is transplanted into a soil adjacent to the bank of a stream, if possible.

At the age of five years, the tree comes into bearing, but the fruit is of a poor quality and gradually improves as the tree matures. Fruit of a good quality, as a rule, can not be expected until the tree is thirty to forty years of age. The life of the lichee tree is several hundred years.

(I think the chinese cannot graft the litchee at all. The few specimens that I saw were inarched ones; perhaps they might layer them also. Added note by F. N. Meyer.)

In April or May the lichee tree is in blossom, and if during these months it is visited by strong winds and heavy rains, in all probability it will not bear fruit.

It is said by the Chinese, and it is a very interesting fact to note, that prior to the plucking of the tree, it is immune from the ravages of insects and birds. The tree is protected, the Chinese say, by a kind of black-winged insect which spins its web in the tree and emits an unpleasent odor which effectually protects it from destructive insects and birds. But if any of the fruit is plucked, the tree is deserted by the black-winged insect and is left a prey to its enemies. Accordingly, the farmer who is wise will take the precaution to strip the tree of all of its fruit as quickly as possible.

Generally speaking, the lichee harvest occurs in the months of June and July, one variety after another coming to maturity. The poorest fruit marks the beginning and end of the season, the best coming in during the middle of the season.

The different species of the lichee are too numerous to mention, but the following are commonly considered as the most popular:

1. *Yuk-ho-po* - "jade purse" - having a thick skin, green color, a large kernel, and a sour taste. It is inferior in quality, but as it is the first to make its appearance, coming in about the 5th of May, it is given a good reception.

2. *Hark-yip* - "black leaf" - dark-red in color, delicate skinned, fragrant and sweet. This is one of the best lichees and comes into bearing about June 6th. The best of this variety is produced in the Tung Kun district and the Shui Tung district. It is plentiful in the market and very popular.

3. *Kat-jat-kwo* - "cockroach fruit" - dark-red, thick-skinned, pear-shaped. This fruit is inferior in quality.

4. *Wai-chi* - "Wai fruit" - the most common variety of lichee on the market in this province. Some are light and some dark-red in color, and are thin-skinned. It is produced between the 21st of May and the 21st of June, and is considered a good variety.

5. *Chui-ma-chi* - "green-spotted lichee" - of a green color and sour taste. There are very few in the market.

6. *Tong-pok* - "sugar sheets" - of a dark-red color, pearshaped, and sweet flavor, but not of a delicious taste. It is produced for the most part in the Namhoi and Samshui Districts.

7. *Kwai-mi* - "cinnamon flavor" - light-red, rough-skinned, small kernel, very fragrant and sweet. One of the best varieties of lichees. It is placed on the market about June 21st. The best are obtained from Lo Kong Tung, in the Pun Yu district.

8. *Shan-chi* - "hill fruit" - of a red color and round shape; slightly sour.

9. *Hom-shiu-chi* - "Magnolia fruit" - light-red, small-sized, sweet tasting, but not delicious. Attached to each lichee of this species is a smaller green one.

10. *No-mai-chi* - "glutinous rice-cake". This is one of the most popular lichees; thin-skinned, fragrant and sweet, and good appearance. It has a very small kernel and a heavy pulp. It is produced in the month of June and comes mostly from Pun Yu and Canton.

11. *Fei-tsze-siu* - "smiling Imperial Concubine" - half red, half green, round-shaped, thick rough skin; good flavor, with a slightly sour taste. It is produced at the end of June, mostly in Shiu Kwan and Ying Tak, and is considered a good fruit.

12. *Chun Fung* - "Phoenix lichee" - small, round, of a red

color and thick skin; not good in taste.
13. *Heung-lai* - "fragrant lichee" - produced in the Sun Hing district; small and round, of a red color and rough-skinned; fragrant and sweet. It was formerly an article of tribute to the Throne. The *heung-lai* is produced at the the end of June.
14. *Kwa-luk* - "green mounted lichee". This lichee is grown in the Tsang Shing district. Its characteristics are a round shape, fine skin, and delightful red color; fragrant and sweet. It is considered superior to the *no-mai-chi* and the best lichee that can be had in Kwangtung Province. It is difficult to obtain in the market. This species usually grows in pairs,- one large red, and the other a small green. The green one is not edible. The genuine *kwa-luk* is grown from only one tree, which is inside the Tsang Shing Magistracy. During the Manchu regime the fruit of this tree was accepted as tribute by the Emperor. The lichees of this variety grown in the neighborhood are also considered as good fruit, but they are almost monopolized by the officials. The *kwa-luk* lichee is chiefly used for presentation purposes between officials, from two to eight lichees being placed in one box. The genuine *kwa-luk* can be obtained only with great difficulty.
15. *Sheung-shu-wai* - "Chancellor's wai-chi" - produced in the Tsang Shing district It resembles the *wai-chi* in appearance, but its taste is that of the *no-mai-chi*. It is one of of the best varieties of the lichees and is placed on the market about the 7th of July.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Seed Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.
Edward Goucher, Propagator, in charge of Quarantine Greenhouse.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Jonnston, in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodo no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF DIVISION OF FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have arrived during the month at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture. These descriptions are revised and published later in the Inventory of Plants Imported.

No. 113. SEPTEMBER 1915.

Genera Represented in This Number.

Allium	41056	Melinis	41148
Amygdalus	41149	Myrica	41256
Buddleia	41114	Osteomeles	41111
Cacara	41143, 41167	Oxalis	41168-176
Carica	41147, 41298	Pennisetum	41055
Chayota	41092-096	Pimenta	41134
	41135-140	Polakowskia	41141
Chionanthus	41259	Primula	41277-281
Citrullus	41164	Prunus	41257
Citrus	41088-091, 41099	Solanum	41197-243, 41312
	41124, 41270	Triticum	41064-087
Escallonia	41105, 41112	Tropaeolum	41185-186
Eugenia	41057, 41110		41195
Euscaphis	41263	Ullucus	41177-184, 41194
Furcraea	41193		41196
Manihot	41103, 41121-122		

Plates: Near view of Tree-Hazel, Kansu, China.
Diospyros Lotus Fruits, Natural Size.
The Pitaya Fruit in Cross-Section.
Loaf of Bread Persimmon, Natural Size.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the Autumn Catalogue.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Allium cepa L. (Liliaceae.) 41056. Seeds of an onion from Tarum, about 24 miles west of Zendjan (Zinjan), west-Persia. Presented by Mr. R. S. Reed at the request of Col. J. N. Merrill, Persian Army. "Tarum is at an elevation of about 4000 feet; irrigation is used; soil gravelly, probably contains alkali. They are the largest onions I have seen, some of them being six inches in diameter by four in depth or larger. Mr. Reed says the onions of Tarum are much esteemed by the Persians who eat them raw as they have such a good flavor." (*Merrill.*)

The following peach seeds and many others have been introduced for the studies of the Office of Horticultural and Pomological Investigations. Steps will be taken to secure plants of the best of these varieties for trial in the United States.

Amygdalus persica L. (Amygdalaceae.) 41149. Seeds of two different strains of peach from Chungking, China. Presented by the American Consul. "These peaches are locally known as *Hsiang T'ao* or Fragrant Peach, and *Chieh T'ao* or Firm Peach. The *Hsiang T'ao* is a large peach and its skin and meat are partly red. It becomes soft when ripe and the seed is readily extracted. It has a very delicious flavor. The *Chieh T'ao* is slightly smaller in size than the *Hsiang T'ao*, and when ripe, its meat is still quite firm. This peach ripens in this climate during the latter part of June, while the *Hsiang T'ao* ripens about a fortnight earlier. This is also a very finely flavored peach, but not quite so sweet as the other. These peaches are comparatively free from imperfections, a fact which is noteworthy in view of an absence of pest preventive measures." (*Myrl S. Myers.*)

Buddleia incana Ruiz & Pavon. (Loganiaceae.) 41114. Cuttings of *quishuar* from Pinasniocj, Peru. Presented by Mr. O. F. Cook. "A tree with grayish foliage somewhat resembling the olive, with rather attractive clusters of yellow flowers. It grows on the high tablelands of southern Peru where frosts are of rare occurrence during the winter season. It grows rapidly and propagates readily from cuttings. The wood is said to be very hard and durable. Of possible interest for ornamental planting or windbreaks in the coast district of southern California." (*Cook.*)

Cacara erosa (L.) Kuntze. (Fabaceae.) 41143. Seeds of yambeans from Calcutta, India and Buitenzorg, Java. Presented by the Economic Botanist, Botanical Survey of India and the Director, Department of Agriculture, Java. "The plant is described as a bean with an edible tuber. The tubers are usually the size of an orange. Flesh white, somewhat like a turnip. It is usually eaten raw, though I

believe the Chinese sometimes cook it with pork, and the Burmese with their curries. This vine requires a long season. The tuber is cooling and refreshing, being as juicy as an artichoke." 41167. "*Bangkoewang*. This variety is the only one cultivated by the natives here."

Carica papaya L.(Caricaceae.) 41167. Seeds of a papaya from Macuco, Estado do Rio, Brazil. Presented by Mr. T. R. Day. "*Mamao* (pronounced 'Mamong' very nearly, with accent on the second syllable) appears to be the same as the papaya of India, but the fruit here like that of the Brazilian mango also is superior to the Indian varieties we have encountered, although it is not so esteemed here here as it is by the natives in India. This is an unusually good variety, and we think that if not already introduced or experimented with, it is well worth trail in the United States in sheltered places where there is practically no winter. It will grow in any soil, and fruits within twelve months, continuing in bearing for some or five years. Among other uses it serves as a very good shade tree for young fruit plantations of tender varieties, as it is such an extraordinary rapid grower, and is very easily cut out when it has served its part." (*Day*.)

Carica quercifolia (St. Hil.) Benth. & Hook. (Caricaceae.) 41298. Seeds from Buenos Aires, Argentina. Presented by Mr. Benito J. Carrasco, Director General, Botanic garden.- A small tree, closely related to the papaya (*C. papaya*,) usually forming a rather straggly growth up to 20 feet in height. The alternate leaves are simple, entire to lyrate-lobed, the blades often 12 inches long by 8 inches broad, smooth, and somewhat glaucous. The flowers are dioecious, greenish yellow, in small, rather inconspicuous clusters. The fruit is a pulpy berry 4 to 7½ inches long, tasting somewhat like a papaya fruit. The juice is said to have medicinal properties, being regard ed as anthelmintic. The leaves are also used as soap in cleansing goods. (*Adapted from Thos. Morong*.)

Chayota edulis Jacq. (Cucurbitaceae.) 41092-96. Fruits of five varieties of chayote from Kingston, Jamaica. Presented by Mr. Wm. Harris, Superintendent Hope Gardens. "Spiny green, large smooth green, medium sized green, small green, and long white."

Chayota edulis Jacq. (Cucurbitaceae.) 41135-40. Fruits of six varieties of chayote from San José, Costa Rica. Presented by Mr. J. E. Van der Laat, Director, Department of Agriculture, through Dr. Carlos Wercklé. "Small white, spiny white, large light green, large white, large dark green, and large light green." Introduced for study and experimental tests by this office.

Chionanthus retusa Lindley. (Oleaceae.) 41259. Seeds of the Chinese fringe-tree from Pan shan near Hangchow, China. "Generally seen as a shrub, but occasionally found as a tree, a most beautiful and striking object when covered with its multitude of small finely dissected white flowers, which are delightfully fragrant. Bears in early fall masses of blue black berries. This plant naturally loves rocky mountain slopes and contrasts well with boulders and stones. Is used by Chinese gardeners in Shan tung as a grafting-stock for the tea-olive, *Olea fragrans*, no doubt to keep the latter dwarf and cause it to withstand drouth much better than when on its own roots. Much recommended as an ornamental garden and park shrub, especially for those sections of the United States where the winters are not too severe. Local Chinese name *Swe tsin tiao*." (Meyer's introduction and description.)

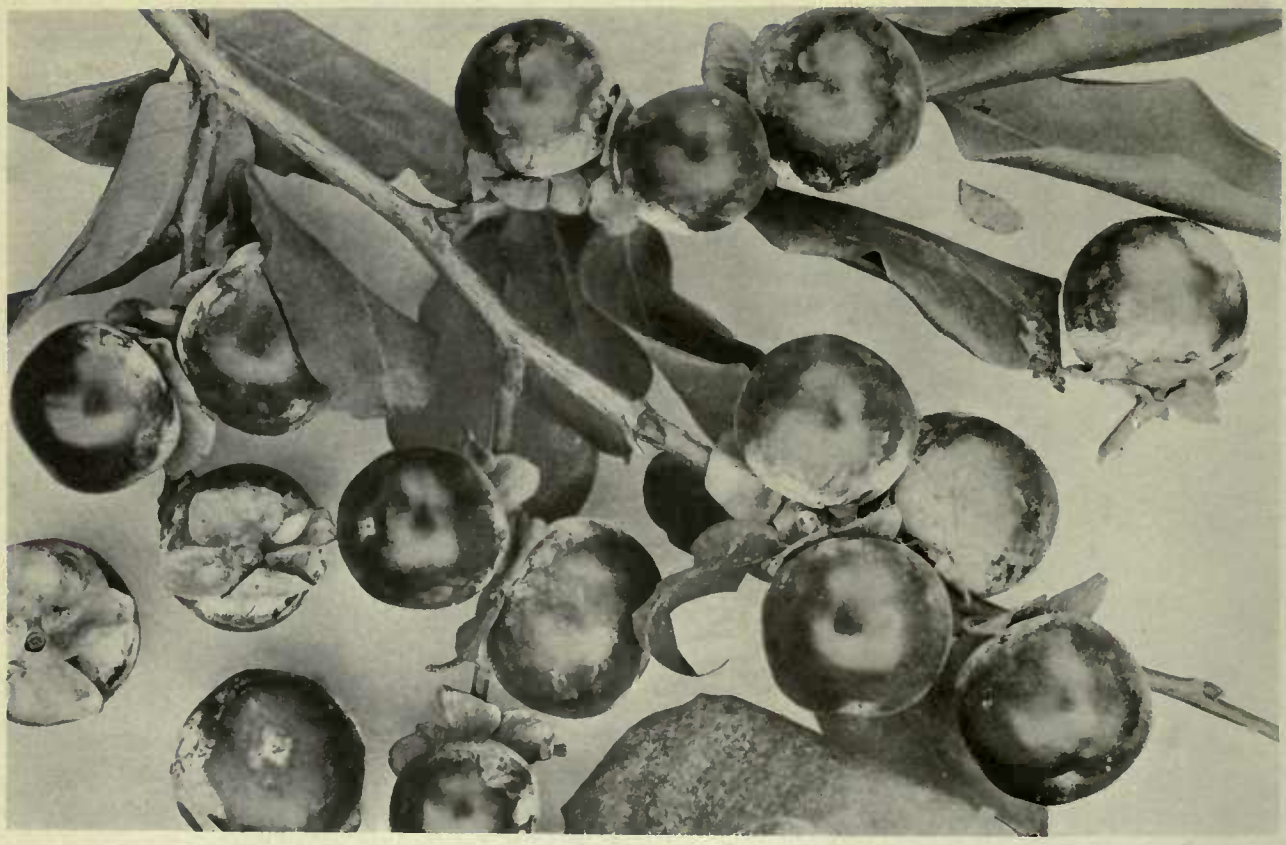
Citrus nobilis deliciosa (Tenore) Swingle. (Rutaceae.) 41088-91. Cuttings of four mandarins from Redland Bay, Queensland, Australia. Presented by Mr. James Collins. 41124. Seeds from Rev. R. E. Pettigrew, Paranagua, Brazil. Presented by Rev. A. J. Holt, Kissimmee, Florida. "Brazilian tangerine. Mr. Pettigrew tells me that this is the finest tangerine that grows, that it is as large as a grape fruit and sells in New York at 25 cents each." (*Holt.*) 41270. Cuttings of a mandarin from Suva, Fiji Islands. Presented by the Superintendent, Department of Agriculture. "The local mandarins are most excellent in quality, of large size, good flavor and juicy, but with skins rather coarse." (*C. H. Knowles.*)

Citrus sp. (Rutaceae.) 41099. Cuttings of a sweet lemon from Santa Ana, Peru. Presented by Mr. O. F. Cook. "A large and very vigorous form of the sweet lemon, a rather popular fruit in the Urubamba valley." (*Cook.*)

Escallonia spp. (Saxifragaceae.) 41105, 41112. Cuttings from Pinasniocj, Peru. Presented by Mr. O. F. Cook. 41105. "*Tasta.* A tree related to the *Chachacoma*, but with much smaller leaves and more horizontal branches giving the general appearance of a hemlock or other coniferous tree. Attains an altitude of 12,000 feet where heavy frosts are of nightly occurrence during the winter. Should be tested first along the Pacific Coast." 41112. "*Chachacoma.* A tree of ornamental value, producing clusters of white flowers for a long period during the winter months. The trees attain a height of 30 or 40 feet and a diameter of 2-3 feet. The wood is of excellent quality, having very little grain and used especially for carving and household utensils. Should endure frosts and may prove useful, especially along the Pacific Coast." (*Cook.*)

Near view of Tree-Hazel (S.P.I. No. 39907), Kansu, China.

"The trunk of a tree-hazel, *Corylus thibetica ferox* (Bat.) Franch., over 80 feet in height, with a girth of several feet at the base. This hazelnut might be cultivated as a nut-tree on stony mountain slopes; it can also be planted as an ornamental park tree, while possibly it may also be utilized in certain hybridization experiments in connection with *Corylus colurna*, another tree-hazel." Photograph by Frank N. Meyer, near Pao dji, Kansu, China, November 7, 1914. See Plant Immigrants No. 106, February, 1915, for description of this tree.



Diospyros Lotus Fruits (S.P.I. No. 40024), Natural Size.

"A variety of the 'ghoorma' having much larger fruits than the ordinary type, while their color is yellowish. Some of these fruits look so much like miniature *kaki* persimmons that one wonders if *D. kaki* could not have been derived from this species in the remote past." Photograph by Frank N. Meyer, Lian dja pa, Kansu, China, October 20, 1914. See Plant Immigrants No. 107, March, 1915, for description of this fruit.

Eugenia sp. (Myrtaceae.) 41057. Seeds of the guava-berry tree from St. Croix, Danish West Indies. Presented by Mr. Longfield Smith, Director Agricultural Experiment Station. "The fruits of this tree make a delicious preserve with an aromatic flavor; they are also used with rum for making a liquor called guava-berry rum." (*Smith.*)

Eugenia sp. (Myrtaceae.) 41110. Cuttings from Pinasniocj, Peru. Presented by Mr. O. F. Cook. "Extremely beautiful tree, with fine glossy deep green foliage contrasting with a smooth light-colored, graceful trunk and branches." (*Cook.*)

Euscaphis japonica (Thunb.) Dippel. (Staphyleaceae.) 41263. Seeds from near Hangchow, Chekiang, China. "A shrub, with deciduous pinnate leaves, bearing apparently white flowers, followed by capsules which turn from green to a brilliant red when ripening. Found on stony and waste places. Of use as a park shrub for mild wintered regions." (*Meyer's introduction and description.*) "A deciduous bush up to 12 feet high, with stout, pithy branchlets and prominent buds; twigs smooth. Leaves 6 to 10 inches long, opposite, consisting usually of 7 or 9 leaflets. Leaflets opposite, ovate 2½ to 4 inches long, long-pointed, shallowly toothed, smooth except for a little down near the base of the midrib. Panicle terminal, branching, 4 to 9 inches long, carrying numerous yellowish white flowers, each about ¼ inch across. Fruit consisting of 3 somewhat boat-shaped, spreading, rosy pink pods, ½ inch long; seeds black. Native of China, Corea, and Japan. This shrub is not only closely related to the bladder-nuts (Staphylea), but also bears much resemblance to them. It differs in the larger number of leaflets, in the smaller individual flowers, and in the smaller, differently shaped fruit. Unfortunately it is not very hardy, and can only be grown outside permanently in the mildest localities." (*W. J. Bean.*)

Furcraea sp. (Amaryllidaceae.) 41193. Bulbs from Ollantaytambo, Peru. Presented by Mr. O. F. Cook. "*Chuchao.* A native fiber plant very abundant in the dry districts about Ollantaytambo, and ascending to an altitude of over 10,000 feet. Propagates by bulblets which are produced on the inflorescences, with or without flowers. May have possibilities as a hardy type, very easy of propagation." (*Cook.*)

Manihot dulcis (Gesner) Baillon. (Euphorbiaceae.) 41103, 41121-22. Cuttings of three varities of sweet cassava from Peru. Presented by Mr. O. F. Cook. 41103. "*Yuca.* San Miguel, Peru. A seed-bearing native grown at the upper rim of the tropical belt, at an altitude of 6,000 feet." 41121. "*Yuca.* Santa Ana, Peru. A native seed-

bearing variety grown at an altitude of 3,000 feet." 41122. "A variety grown along the coast between Lima and Callao, in a rather cool climate. All three varieties should be tested in California and the South." (*Cook.*)

Melinis minutiflora Beauv. (Poaceae.) 41148. Seeds of molasses grass from Macuco, E. do Rio, Brazil. Presented by Mr. T. R. Day. "There are two grasses here that are worthy of special mention, the doubt as to adaptability being with regard to the winters in the Southern States, which I understand are in some places fairly severe. They are called *Capim Gordura Roxa*, and *Capim Jaragua*. *Capim Gordura Roxa* means literally 'greasy purple grass'. I have seen *Capim Gordura Roxa* live down the wild fern that is such a plague in some districts, and form (where not pastured) a dense carpet between three and four feet thick upon which it was almost possible to walk. Riding or walking through it in the pasture under normal conditions the proportion of wax and grease on the blades is sufficient to thoroughly clean and polish one's boots; this is no exaggeration, but is often remarked. It is not a watery grass, but unusually palatable to cattle and horses and the blades secret a wax or grease that according to one analysis totals as much as 3.22 per cent of the dry digestible matter. It is sensible to the finger , which it makes quite sticky. I have not met it in any other country, and I believe that it is indigeous to the central part of Brazil, not thriving right down in the South nor in the sandier coast states of the North. It is a fairly good drought resister, and comes up fairly well again after a fire. There is a related variety called *Capim Gordura Branco* (*Branco* means white) of a bright emerald green color, but without the resistence of the *Roxa*, and also not stooling so well. I have found both of the above grasses growing away from sea level up to 2000 meters on Caparaó, the highest mountain of Brazil, and I have found it at 1000 meters living down the wild fern (both these altitudes are susceptible to frost), and I have ridden through it on the uplands of Minas Geraes coated with a dense white frost." (*Day.*)

Myrica rubra Sieb. & Zucc. (Myricaceae.) 41256. Seeds from Hangchow, Chekiang, China. "A large fruited variety of the so-called strawberry tree or *Yang mae*. The fruits are the size of crabapples, of dark purple color and very attractive looks. They can be used in a multitude of ways, like out of hand, boiled in compotes, in pies, for syrup, and for wine. In general there exists a great variation among the trees as regards general habit, productivity, etc. The fruits themselves vary also greatly in color, size and

taste. The best varieties are propagated by inarching. The trees are evergreen, they thrive best on well drained, rocky terraces. The localities that will best suit them in the United States will probably be the Southern sections of the Gulf Coast States and the milder parts of California. Chinese name *Yang mae*." (Meyer's introduction and description.)

Osteomeles sp. (Malaceae.) 41111. Plants from Pinasniocj, Peru. Presented by Mr. O. F. Cook. "*Lengli*. A very attractive tree, with deep green, holly-like foliage and clusters of red berries. Somewhat resembling our thornapple trees, Crataegus, but with much more handsome evergreen foliage. Should be of interest for Pacific Coast if it should be found to thrive." (*Cook.*)

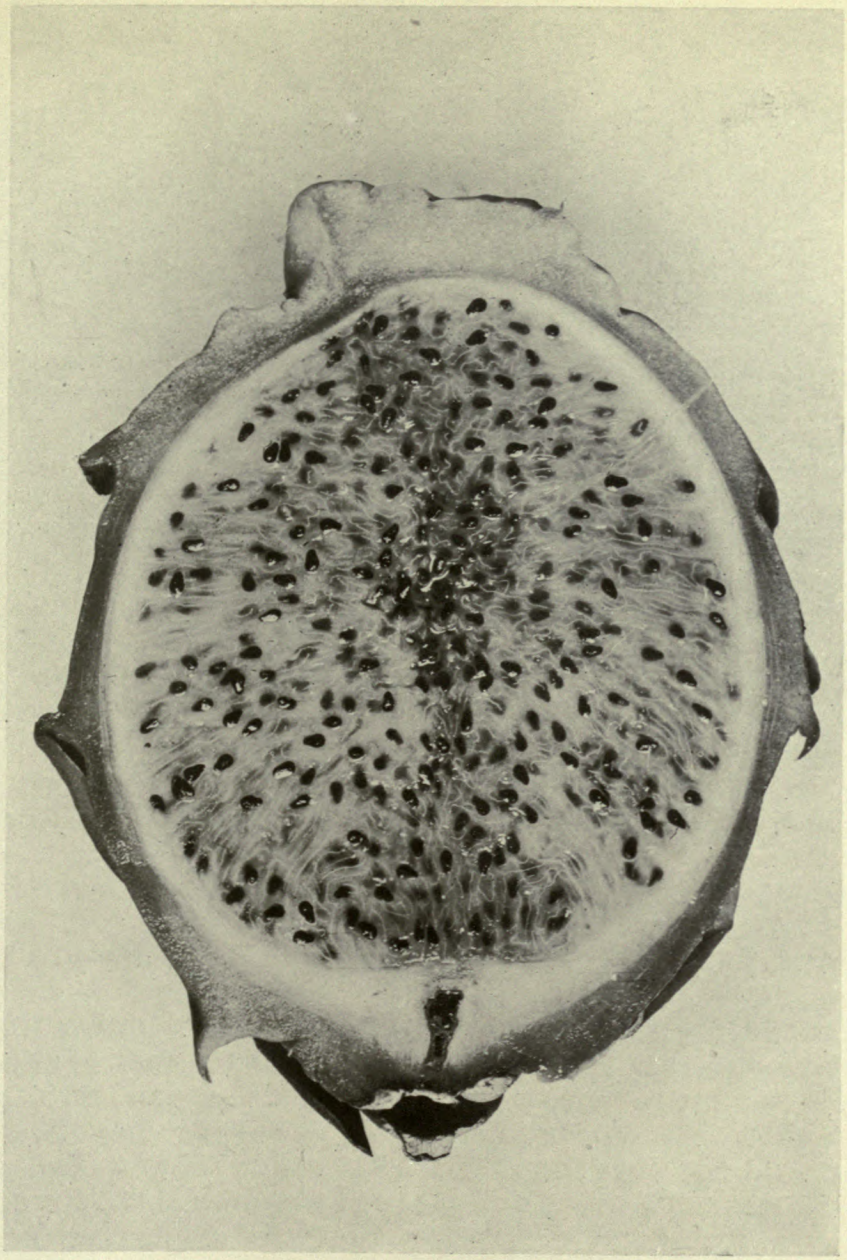
Oxalis tuberosa Molina. (Oxalidaceae.) 41168-76. Tubers of oca from Ollantaytambo and Sicuani, Peru, and La Paz, Bolivia. Presented by Mr. O. F. Cook. "A plant related to our common sheep-sorrel, widely cultivated in Peru and Bolivia for the sake of its fleshy root-stocks, which are an important article of food. In some districts ocas are second only to potatoes, while in others ullucus are more important, or at least are sold more generally in the native markets. Ocas are eaten raw, as well as cooked, and are also frozen and dried. Ocas prepared in this way are called *caya*, a term corresponding to chuno (chunyo), the name of the dried potatoes. Raw ocas, when first dug, have a distinctly acid taste, like sheep-sorrel, but this is lost after the tubers have been exposed to the sun. The plant attains a height of one foot or more and has the general appearance of a large sheep-sorrel. The flowers are yellow and the leaflets are folded at night or in wet weather, the same as in the sheep-sorrel. The varieties are numerous, though much fewer than in the case of the potato. Some are preferred for eating raw and others for the making of *caya*. The texture of the tubers is very tender and juicy. In form some are nearly cylindrical, while others are slender at the base and strongly thickened at the end. The colors vary from white or light pink through darker pinks or yellows to deep purplish red. The range of colors is much the same as in the ullucu, but no deep yellow varieties were seen, nor any with spots, except that some have bands of deeper color across the eyes. In addition to the pleasing coloration, the surface of the tubers is smooth and clear, so that the general appearance is very attractive. The texture of the flesh is also very tender and crisp. If the taste should prove acceptable ocas might become very popular for salads and pickles, if not for other purposes. The nature and habits of the plant

indicate that it may be adapted to acid soils, which would be a distinct advantage in some parts of the United States." (*Cook.*)

Pennisetum longistylum Hochst. (Poaceae.) 41055. Cuttings of Kikuyu grass from Pretoria, Union of South Africa. Presented by Mr. I. B. Pole Evans, Chief, Division of Botany. "We originally obtained this grass from British East Africa, and it, so far as our experience goes, would appear to be one of the most promising grasses that we have in this country. So far, although the grass has been under cultivation at our Botanical Station for the past 4 years, it has shown no signs of forming seed and it was only last summer that it flowered and enabled us to have it determined botanically. The grass has a creeping habit and cattle are passionately fond of it; it also makes a nice hay grass." (*Pole-Evans.*)

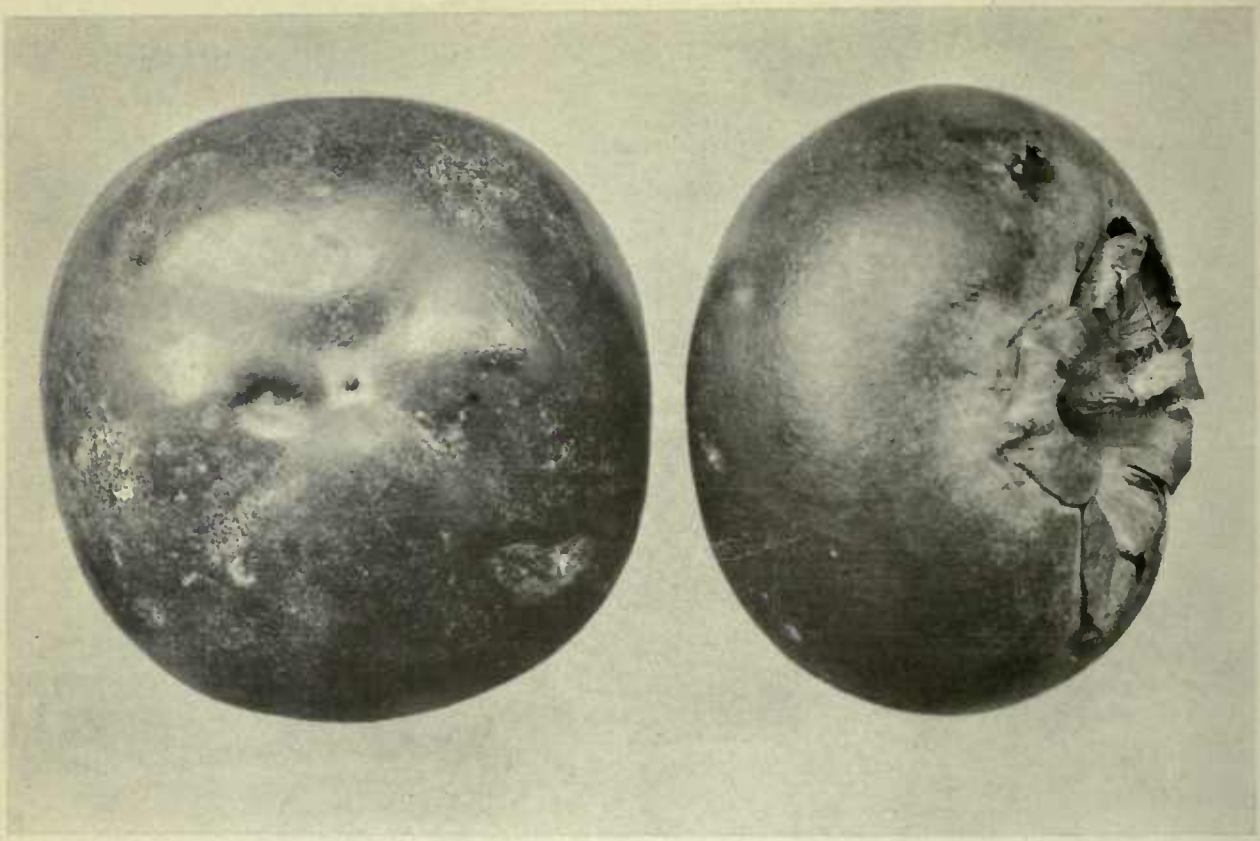
Pimenta officinalis Lindley.(Myrtaceae.) 41134. Seeds of allspice from Kingston, Jamaica. Presented by Mr. W. Harris, Superintendent, Hope Gardens. "A small tree with smooth, white bark, 25 to 30 feet high, native of the West Indies and Central America. The dried unripe berries, which are the size of small peas, are the Allspice or Pimento of commerce. The name 'all-spice' is due to a supposed resemblence of the spice to a combination of the odour and flavour of cinnamon, nutmegs and cloves. The tree has been introduced into Ceylon over a century ago, and established at Peradeniya, where it flowers in the dry weather and occasionally sets a few fruits,but outside the Botanic Gardens it is rarely met with in this country. It is considered to yield best in a hot and rather dry climate, and prefers a loose loamy or alluvial, well-drained soil. In Jamaica the berries are picked by hand while green, but just ripe, and are then dried in the sun, the latter process taking six to ten days. The fruits are known to be sufficiently dry when the seeds rattle on shaking and are of a dark colour. A crop cannot be expected within six or seven years from the time of planting, and when in full bearing a tree will yield a hundredweight of dried spice. Jamaica is the only country that exports this spice, which is sold at present in England at about 2d. to 3d. per pound." (*MacMillan, Handbook of Tropical Gardening and Planting.*)

Polakowskia tacaco Pittier. (Cucurbitaceae.) 41141. Fruits of *tacaco* from San Jose, Costa Rica. Presented by Mr. J. E. Van der Laat,Director, Department of Agriculture, through Dr. Carlos Wercklè. "The *tacaco* is not of perishable nature, as the chayote; it has a hard skin, when ripe, and keeps in perfect condition for weeks; at last it shrivels and in this state it is planted. The fruits for plant-



The Pitaya Fruit in Cross-Section, Natural size.

The fruit of this cactus, probably *Cereus triangularis*, is commonly sold on the Havana market in July and August. The color is a beautiful deep pink, while the soft translucent sweet pulp is whitish. Photograph by Wilson Popenoe, July 30, 1914, No. 16110. Havana, Cuba.



"Loaf of Bread Persimmon" (S.P.I. No. 39912), Natural Size.

"A singularly beautiful variety of persimmon of well-rounded form. Heavy, very juicy and sweet, seedless, color pale orange. Chinese name *Momo sze tze*, meaning 'Loaf of Bread Persimmon.'" Photograph by Frank N. Meyer, Cheng hsien, Kansu, China, October 5, 1914. See Plant Immigrants No. 106, February, 1915, for description of this variety.

ing are chosen from those which fall off the vine when dead ripe. They can not be planted in the soil; they do not sprout. The best is to bury them in rotting leaves; they will also grow on the earth, with a layer of dead leaves on them." (*Werckle.*)

Primula spp. (Primulaceae.) 41277-81. Seeds of five primroses from Bhutan, India. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley.

Prunus salicina Lindley. (Amygdalaceae.) 41257. Seeds of a plum from Hangchow, Chekiang, China. "A medium sized plum, clingstone, of reddish color, meat juicy and sweet in the center, but somewhat astringent near the skin and decidedly sour near the stone. The trees grow dense and low and are able to grow on water-logged land, that is, they thrive with the surface-water only a few inches away at times. Of value for breeding purposes, especially for the Gulf coast states." (*Meyer's Introduction and Description.*)

Solanum bonariense L. (Solanaceae.) 41312. Seeds from Buenos Aires, Argentina. Presented by Mr. Benito J. Carrasco, Director General, Botanic Garden. Tender evergreen solanaceous shrub up to 10 feet high, with ovate-oblong, sinuate-repand leaves; long lateral racemes of large white flowers; and globose yellow berries. Native of Argentina where it is called *Duraznillo blanco.* Said to have medicinal properties.

Solanum tuberosum L. (Solanaceae.) 41197-243. Tubers of 47 varieties of potato from Peru. Presented by Mr. O. F. Cook.

Triticum spp. (Poaceae.) 41064-87. Seeds of 24 varieties of wheat from Sydney, New South Wales, Australia. Presented by Mr. George Valder, Under Secretary and Director, Department of Agriculture. "The Department's Plant Breeder states that all the following varieties are winter wheats here, but if sown at the same season as such sorts in America they would probably be winter killed. It is suggested that they be sown as spring wheat, with the exception of Marster's Perfection (S.P.I. No. 41072) which should stand the frosts of winter. It may be mentioned that samples of the ordinary varities recommended to farmers in this country have invariably been sent abroad, and almost without exception have proved unsuitable for American and European conditions. It has been found that they either become eaten up with spring rust or do not survive the winters." (*Valder.*)

Tropaeolum tuberosum Ruiz & Pavon. (Tropaeolaceae.) 41185-86, 41195. Tubers from Peru. Presented by Mr. O. F. Cook. "One of the Andine root-crops, generally cultivated in the potato growing districts of the plateau region of

Peru. Though apparently less popular than the Oca and Ullucu, the *Anyu* has one important advantage over all the Peruvian root-crops, including the potato, in its keeping qualities. Specimens collected in the district of Sicuani on April 9th were kept for three months at Ollantaytambo, and then brought back to Washington, and were still in good condition the middle of September. This means that the *Anyu* tubers would be very easy to handle commercially in case they should prove to be of use in the United States. In Peru they are eaten like potatoes, papa lisas, and ocas, chiefly in the form of soups. The *Anyu* plant is a rather close relative of another Peruvian species, *Tropaeolum majus*, a familiar ornamental cultivated in the United States under the name Nasturtium. Hybrids between these two species might be of interest as affording a possibility of securing ornamental varieties that could be propagated from tubers. The flowers of *T. tuberosum* are not so large as those of *T. majus* and do not open so widely, but in other respects the general appearance is much the same. Experimental plantings of *Anyus* should be made in the elevated districts of the southwestern states, and along the Pacific Coast. In comparison with potatoes there appear to be very few varieties of *Anyus*." (*Cook.*)

Ullucus tuberosus Caldas. (Basellaceae.) 41177-84, 41194, 41196. Tubers of 9 varieties of Ullucu from Peru and Boliyia. Presented by Mr. O. F. Ccok. "The *Ullucu* or *Papa lisa* is a root-crop, raised generally in the highlands of Peru and Bolivia, in the regions where potatoes are grown. The tubers have a remarkably close resemblance to potatoes, except that the skins are smoother and the colors brighter, running from white through various intermediate shades to deep yellows and reds. There are also spotted varieties, white and pink or light yellow and pink. Judging from its representive in the native markets, the *papa lisa* ranks next to the potato in popular favor in Peru, being used largely in the making of soups, which is the principal branch of the culinary art among the Indians. The flavor of the *papa lisa* is peculiar, and usually not attractive to the unaccustomed palate. But being one of the plants that accompany the potato in Peru, it may not be without interest to observe its behavior in the United States. The tubers are produced in abundance and if the plant should be found to grow readily the possibilities of utilization should be carefully studied. The plant is a relative of the so-called Madeira vine, familiar in cultivation as an ornamental climber. A wild *Ullucu*, common in the region of Sicuani, is very similar to the Madeira vine but the plants of the cultivated varieties do not attain a length of more than two or three feet. The general appearance and habit of growth are also somewhat like those of the sweet potato." (*Cook.*)

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.
Edward Goucher, Propagator, in charge of Quarantine Greenhouse.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Cartagena, Colombia.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodo no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behaviour in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 114. OCTOBER 1915.

Genera Represented in This Number.

	Page		Page
Amygdalus	929, 934	Licania	932
Annona	929	Lucuma	932
Blighia	934	Macadamia	935
Castanea	929	Osteomeles	933
Chayota	929	Populus	935
Citrus	930	Primula	934
Diospyros	930, 931	Prunus	934
Escallonia	931	Pyrus	935
Fraxinus	934	Tamarix	934
Homoioceltis	932	Ulmus	935
Juglans	932	Ziziphus	935

Plates:

A Chinese Catalpa (Catalpa bungei.)
A Manchurian Crabapple (Malus baccata mandschurica.)
Tung Oil tree (Aleurites fordii.)
A field of Sesame in China (Sesamum orientale.)

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it, as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

NEW INTRODUCTIONS.

Amygdalus persica L. (Amygdalaceae.) 41395. Seeds from Kia ying chau, Swatow, China. Presented by Mr. George Campbell, through Mr. George C. Hanson, American Consul, Swatow. "Peach pits from a curious little tree grown here only in pots as a house plant. The leaves are like other peach leaves but its manner of growth is quite different. This particular tree is now just 15 inches high and had five full-sized peaches, somewhat smaller than American ones. I broke off two or three other fruits when quite small. They are borne on the main trunk on stems about a quarter of an inch long and make one think of Papayas. The lowest was 6 inches from the earth of the pot and the highest 8 inches, so the five were closely crowded together. The trunk at this point is little if any larger than a lead pencil. The fruit is of a good color, as Chinese peaches go,and taste better than any I have tasted in China. The flesh is white and it clings to the pit. It hangs on the tree a very long time and is quite ornamental. The blossom is quite showy too. The Chinese say it comes true from the pits. I picked the last one yesterday and the first was ripe a month ago. The ordinary peaches here are very poor, not fit to eat unless cooked." (Campbell.)

Annona sp. (Annonaceae.) 41384. Seeds from Cajabon, Guatemala. Presented by Mr. Walter F. Curley. "*Tzumuy Pac*, so called here in the Indian language. I had never seen them before, until some Indians brought them in, they say they are quite common in the mountain Chaal near the British Honduras border, they are quite small, the outside yellow with skin corrugated and resembling the larger fruit *Sincuya*, there is very little inside to eat, but of fine flavor, the seeds are very abundant. Ripe in the district of Cajabon, Guatemala, in September." (Curley.)

Castanea pumila x *crenata*. (Fagaceae.) 41357-41360. Plants of hybrids between the American chinquapin and the Japanese chestnut. Produced by Dr. W. Van Fleet, at Little Silver, N. J. Grown at the Plant Introduction Field Station, Chico, California. "Bear at from one to three years from seed. Good producers and quite resistant to the chestnut bark fungus. Nuts large, of fair quality, with rather hard shells. 41357 and 41358 somewhat larger than an ordinary American chestnut and somewhat sweeter. 41359 and 41360 are much larger than the American type; about the size of a Spanish chestnut, the flavor being very sweet, while the latter is more tender." (Van Fleet.)

Chayota edulis Jacq. (Cucurbitaceae.) 41426. Seeds of chayote from San Jose, Costa Rica. Presented by Dr. Carlos

Wercklé, through Mr. J. E. Van der Laat, Director, Department of Agriculture. "Fiberless cocoros. Very small, entirely coreless and fiberless. I do not know if of all the fruits the seeds are without testa, but the only one I could examine and ate was so; simply the cotyledons in a very small cavity in the center without a shell." (Wercklè.)

Citrus southwickii Wester. (Rutaceae.) 41387. Seeds from Manila, Philippine Islands. Presented by Mr. P. J. Wester, Lamao Experiment Station. "*Limao*. A thorny tree, with dense head and drooping branches, attaining a height of 6 meters. The *limao*, though rare, is not uncommon in Bohol, where it is cultivated and has also been collected by the writer in Baganga, Mindanao. The flowers appear late in April and during the early part of May, with the fruit ripening in January and February; a few fruits nearly full grown were collected in May. Has flowered irregularly from May to December. The fruit is not eaten, but used in washing by the Boholanos and is of no economic importance. The tree is evidently quite drought resistant and succeeds well in very scanty soil underlaid with limestone. The *limao* belongs in that group of the citrus fruits having free filaments, the most conspicuous characters being the compact growth of the crown, the dark-green, thick and distinct leaves, the almost sessile stigma, and the attractive, oblate, regular-shaped fruit with its many locules, exceeding in number those in all other citrus fruits known to the writer. This species has been named in honor of Mr. E. F. Southwick. For full description see The Philippine Agricultural Review, First Quarter 1915. Fruit scarcely edible, plant may make a good stock." (Wester.)

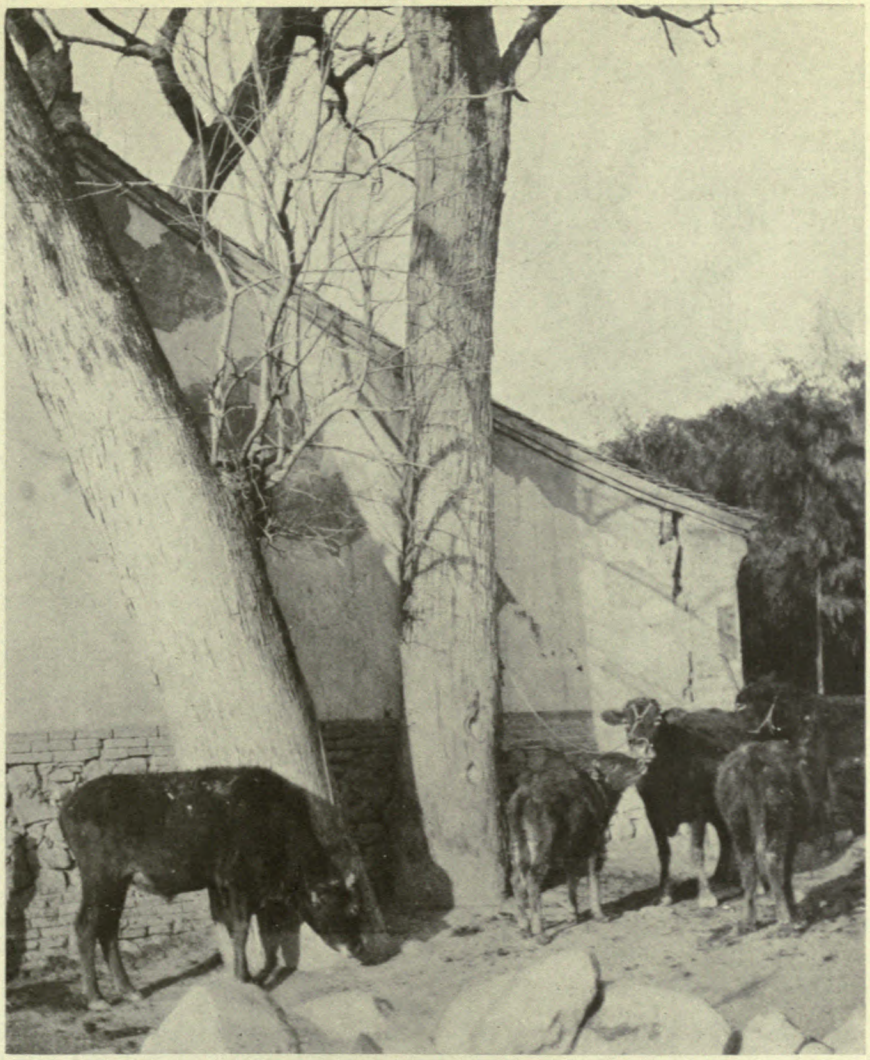
Citrus webberii montana Wester. (Rutaceae.) 41388. Seeds of *Cabugao* from Manila, Philippine Islands. Presented by Mr. P. J. Wester, Lamao Experiment Station. "Fruit makes a fair 'ade. A shrubby tree with slender branches and small, weak spines sometimes absent; young growth green; leaves 8.5 to 14 cm. long, 3 to 3.5 cm. broad, ovate to ovate oblong, crenate, dark green above, shining; base broadly acute to rounded; apex blunt pointed, usually retuse; petiole 24 to 38 mm. long, with narrow wing margin, in large leaves sometimes 17 mm. broad; flowers not seen; fruit roundish oblate, about 45 mm. across, somewhat corrugate, 8 loculed. The general character of the plant and fruit indicate that the *cabugao* is a form of the *alsem*." (Wester, The Philippine Agricultural Review, First Quarter 1915.)

Diospyros kaki L. f. (Diospyraceae.) 41361 to 41371. Cuttings of persimmons from Okitsu, Japan. Presented by Professor Ishiwara, Horticultural Experiment Station.

Diospyros kaki L. f. (Diospyraceae.) 41456. Cuttings from Glendora, California. Presented by Judge Charles Silent, through Mr. Wilson Popenoe. "In the fall of 1914, when in California, I visited Judge Silent's place and noticed this persimmon tree that I became interested in, as the young twigs of all the branches were bearing the old pedicels of staminate flowers in great numbers, and after a careful search of the tree I could discover the remains of only three pedicels of pistillate flowers. If this character should hold good, and we have every reason to believe it will, we have at last found the long looked-for male *Kaki* persimmon tree, and one that should be planted in every orchard of *Kaki* persimmons as a pollinator, for by careful experiment, Professor H. H. Hume has demonstrated that the lack of pollination is the cause of the immature fruits dropping." (Mr. Peter Bisset.)

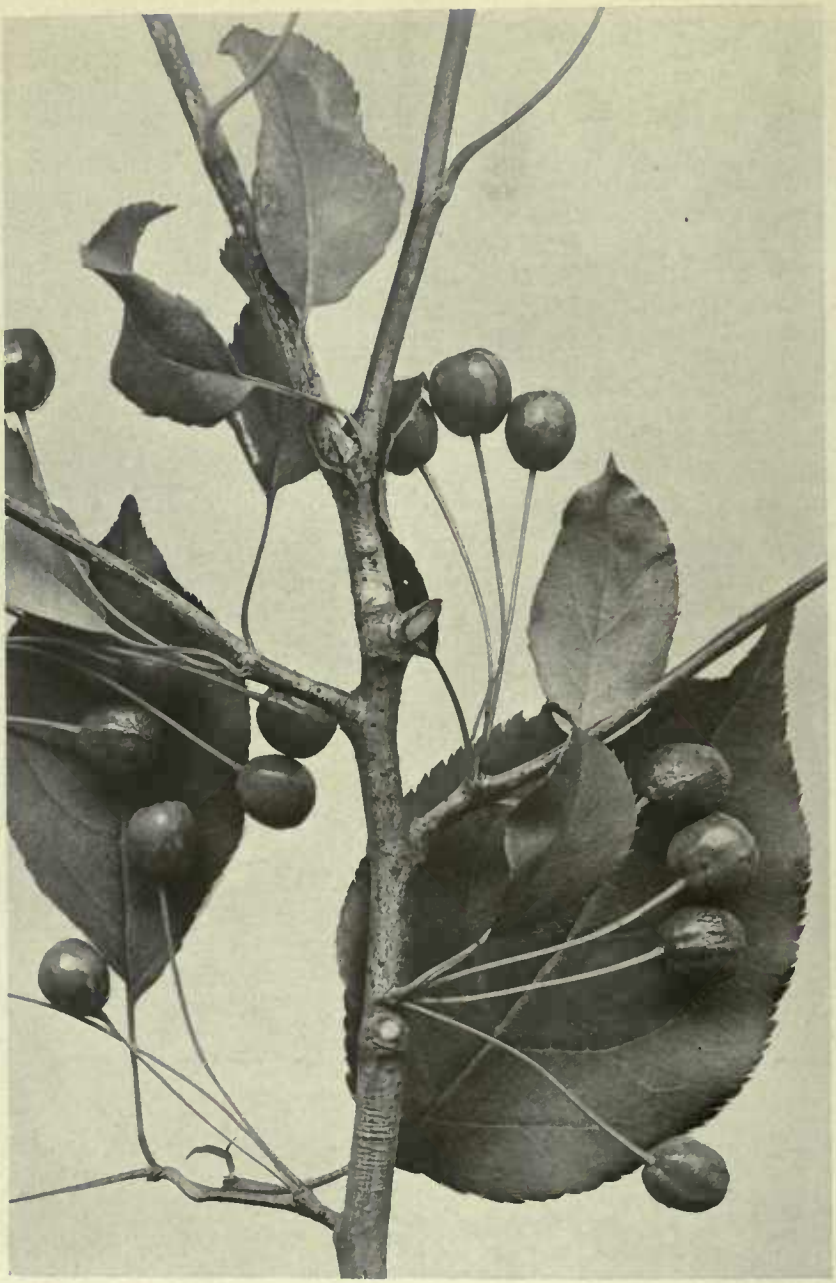
Escallonia resinosa (R. & P.) Persoon. (Escalloniaceae.) 41326. Seeds from Peru. Collected by Mr. O. F. Cook. "A handsome tree bearing clusters of white flowers. It is common in the valleys about Ollantaytambo at altitudes of 9,000 to 11,000 feet. In the lower valleys, where the climate is dry, the *chachacoma* grows intermingled with cacti and other desert vegetation, and seldom attains a height of more than 12 to 15 feet. In the upper valleys where the climate is cooler and the supply of moisture is ample, the *chachacoma* trees grow to much larger size, often attaining a height of 40-50 feet and a diameter of 2-4 feet. The largest trees were seen in the valley below Panticalla Pass, on the south side, but none were found on the north side in the region of Yanamachi." (Cook.)

Escallonia sp. (Escalloniaceae.) 41324. Seeds of *Tasta* from Pinasniocj, Peru. Collected by Mr. O. F. Cook. "A fine-leaved tree, comparable to the boxwood in foliage but with a more open habit of growth and horizontal branches, often giving an artistic effect like some of the dwarfed Chinese evergreens. The appearance is also somewhat similar to that of the *Chachacoma*, but the foliage is much finer, and of a dark and more shining green. Like *Chachacoma*, the trees will endure cutting back to any extent and the new crown soon takes a graceful rounded shape. This may render the *Tasta* very useful for ornamental planting in situations where space is limited, and it should also serve well as a hedge plant. Old trees have deep red heart wood of the same texture and appearance as the wood of *Chachacoma*, and are said to be used in the same way. The form of the fruits also suggests affinity with *Chachacoma*, and the habit of growth is similar, but the flowers are solitary instead of clustered. The color of the flowers



A Chinese Catalpa. (*Catalpa bungei*). S.P.I. No.38254.

This tree is entirely different from the one that passes in the trade under the above name. This species grows to be a tall tree, sometimes 100 ft. in height, with a trunk some 3 to 4 ft. in diameter. It is very ornamental when covered with masses of spotted mauve colored flowers appearing in early summer. The Chinese plant it extensively here and there for its fine timber which is light, strong and durable and is in special demand for table-tops and fine furniture on account of its non-warping nature. Chinese name "Ch'iu shu". Photographed by F. N. Meyer, near Puchow, China, February 9, 1914. No. 5996.



Crabapple. Malus baccata mandschurica.

This crabapple is common in the hills of Manchuria and Eastern Siberia where the thermometer often drops to -45° Fahr. It is remarkably hardy, drouth-resistant and of vigorous growth. The fruits are very small, of sharp sour taste and borne in great masses. The plant often attains the size of a bush only but in favorable localities it grows into a tree 20 to 25 feet tall. The fruits are used as preserves by the inhabitants of Eastern Siberia. Of value as a hardy stock for apples, as an ornamental, and as a fruit tree for the Upper Mississippi Valley regions. Photographed by R L. Beagles, Chico, Calif., July 24, 1915. No. 546.

is said to be white, as in *Chachacoma*. The leaves of young vigorous shoots are much larger than those of mature branches, and are distinctly dentate. Like *Chachacoma*, the tree has the power of rooting from cuttings and layered branches. It ascends to higher elevations than *Chachacoma*, and may be expected to have greater resistance to cold, but less resistance to heat. It may thrive along the California coast as far north as San Francisco and might become popular as an ornamental or hedgeplant." (Cook.)

Homoioceltis aspera (Thunb.) Blume. (Ulmaceae.) 41391. Seeds from Augusta, Georgia. Presented by P. J. Berckmans Company. An ornamental ulmaceous tree up to 60 feet high, with the appearance of a hackberry (*Celtis occidentalis*), with the slender branches forming a dense head. Leaves ovate to ovate-oblong, broadly wedge-shaped at the base, tapering at the apex, 2-3 ½ inches long, serrate with straight veins ending in the teeth. (This last character easily distinguishes this tree from *Celtis sinensis* with which it has often been confused.) The greenish flowers and small black drupes are inconspicuous. Not hardy north of Georgia. (Adapted from Rehder in Bailey, Standard Cyclopedia of Horticulture, Vol. 1, p. 308.)

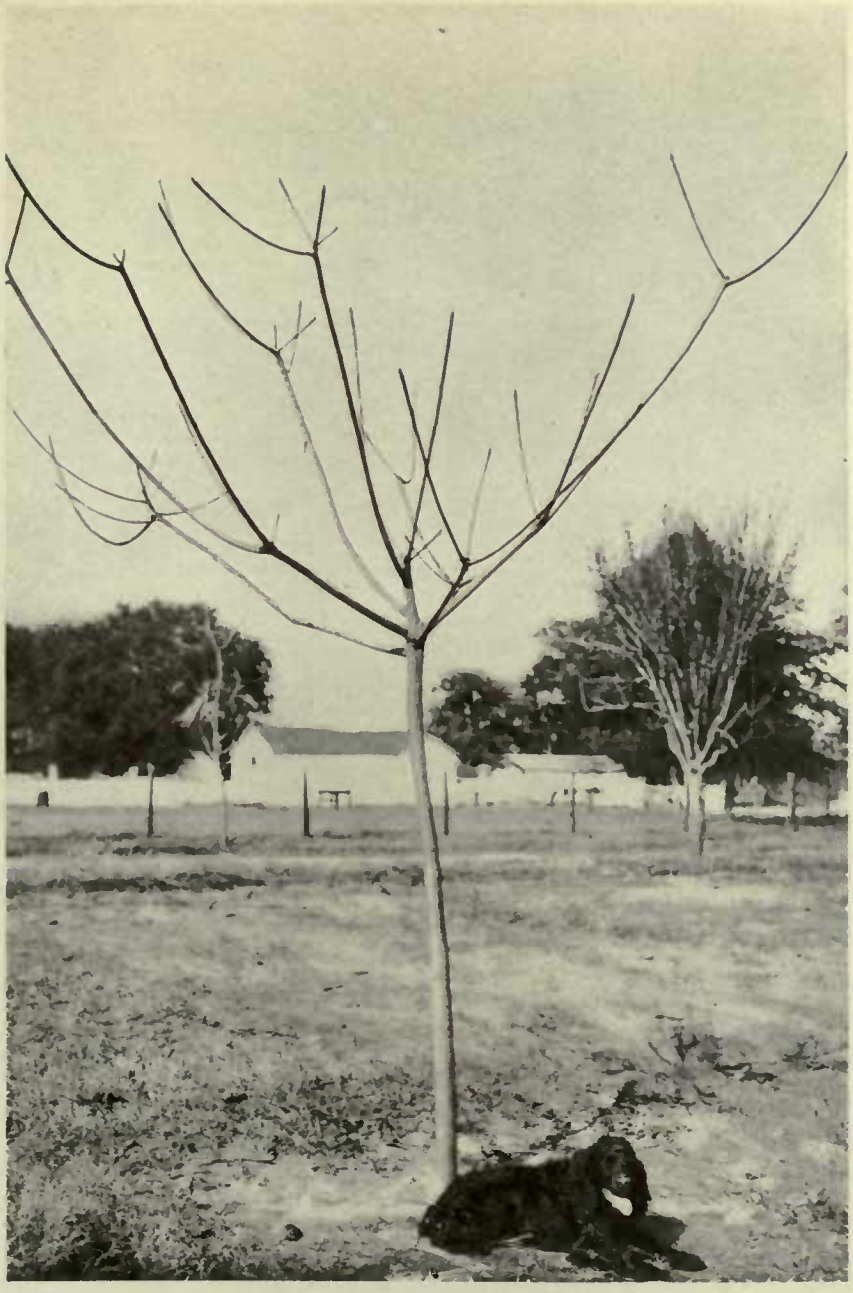
Juglans sp. (Juglandaceae.) 41334. Seeds of *Nogal* from Ollantaytambo, Peru. Collected by Mr. O. F. Cook. "A native walnut cultivated sparingly at Ollantaytambo and in the valleys above and below. Its chief use is to furnish a dye for giving sheep's wool the brown color of the high-priced vicuna ponchos. The leaves and bark of the tree are used for dyeing, the coloring material being extracted by beating and boiling. The nuts are as large as English or Persian walnuts, but the shell is much thicker. The tree is rather small and slender, with large graceful leaves, reminding one of a sumac or Ailanthus. Of possible interest for breeding purposes or for ornamental planting along the Pacific coast or in Florida. Probably a native of the valleys of the eastern slopes of the Andes." (Cook.)

Licania sp. (Rosaceae.) 41393. Seeds of Sansapote from Orotina, Costa Rica. Presented by Dr. Carlos Wercklè, Department of Agriculture. "Inferior to the species from the Atlantic coast, as it has little flesh; still it sells even here in Orotina, 1½ leagues from where it grows wild, for five cents apiece, and smaller two for five cents. One of the most beautiful of all forest trees; of gigantic size; timber nearly as good as *Cedrela*." (Wercklé.)

Lucuma sp. (Sapotaceae.) 41332. Seeds from Ollantaytambo, Peru. Collected by O. F. Cook. "The *Lucuma* is a popular fruit tree in Peru. It is closely related botan-

ically to the Sapote and Injerto of Central America, but the quality of the fruit is entirely different. The flesh is very rich and mealy, more like a cooked sweet potato than like the related fruits. The tree is also of a very compact habit with the rather small obovate leaves clustered closely near the ends of the branches. Another difference is that the *Lucuma* grows and produces fruit at a much higher elevation than the *Sapote*, attaining about 9,500 feet at Ollantaytambo. Thus there would seem to be a much better chance for the *Lucuma* in California or Florida than with the *Sapote*." (Cook.)

Osteomeles sp. (Malaceae.) 41325. Seeds of *Lengli* from Pinasniocj, Peru. Collected by Mr. O. F. Cook. "A tree growing at high elevations,10,000 to 12,000 feet, found in the valleys of two streams tributary to the Urubamba river, one the stream that enters at Ollantaytambo, and the other the stream that comes down from the Panticalla Pass, a few miles below Ollantaytambo. On the other side of the Pass in the upper part of the Lucumayo valley the *lengli* appears to be absent. In unfavorable places where the trees remain stunted they have an appearance somewhat like our Thorn-apple or Hawthorns, but in some of the sheltered ravines and reforested terraces where the conditions are favorable the *lengli* trees attain a height of 30-40 feet with trunks 1 to 2 feet in diameter, and have a very attractive appearance. The foliage is very fine, the leaves being of a very regular elliptical shape with slightly dentate margins. The upper surface is of a fresh deep green color with neatly impressed veins, while the lower surface has a warm reddish brown tomentum, affording a very pleasing contrast. The fruit clusters give a festive appearance like holly, the mature berries being deeply and richly colored. They begin by changing from green through various shades of pink to scarlet red and then pass on through the darker shades of red, becoming eventually almost black. The berries are distinctly flattened instead of round and have the appearance of very small apples. They hang on the trees for a long time, probably all through the winter, with the effects of the Christmas holly. A botanical peculiarity, perhaps of this species, is that the lowest branch of the fruit cluster is usually subtended by a very much reduced, oval, sharp-pointed leaf, or bract, but like the other leaves in color, texture, and persistence. The small leaf adds a little touch to the appearance of a twig with its cluster of berries. This might prove attractive for ornamental planting along the California coast or wherever it will grow. In view of the high altitude where the tree is native it may be expected to stand cold weather, if not actual frost." (Cook.)



THREE-YEAR-OLD TUNG OIL TREE AT TALLAHASSEE, FLA.

A young tree, planted Jan. 7, 1913 as a one year seedling, in the experimental plantation of Dr. Tennent Ronalds. In 1914, in its third year from seed, it bore 17 fruits, and the next year its fourth, it bore 107 fruits. Records are being kept of the yields of the individual tung trees in this plantation to discover if some trees do not yield more regularly and heavily than others. If especially productive strains are found, it will doubtless be possible to top-work the grove with budwood from the productive individuals and to use the latter for general propagation purposes. Photographed by David Fairchild, January 31, 1915, at Tallahassee, Fla. No. 15585.

Sesame. (*Sesamum orientale*).

A field of sesame, carefully pulled out and stacked up. The pods of the sesame plant do not all ripen at once and when fully ripe they open and allow seeds to fall out to a considerable extent, making the crop a very difficult one to handle. If a variety could be found which kept its pods closed up, as the opium poppy does its head, it would be a tremendous gain to all sesame growers. The oil expressed from the seeds is among the most important of food products of China and always commands a good price. The seeds themselves are made into candies in the nature of peanut brittle; and are also baked on thin cakes giving the latter a rich, nutty flavor. Photographed by F. N. Meyer, near Pang Kwan chen, Shensi, China, Sept. 3, 1914, No. 13180.

Primula spp. (Primulaceae.) 41404, 41406, 41408-41412, 41416. Seeds of eight primroses from Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley.

Prunus sp. (Amygdalaceae.) 41455. Two plants of a plum from Tsao chou fu, Shantung, China. Collected by Mr. F. N. Meyer. "A flowering plum, much beloved by the Chinese for forcing purposes. Generally being trained in grotesque shapes and always grafted on *Amygdalus davidiana*, as the last one stands drouth, transplanting and neglect better than the plum's own roots. Chinese name *Mei*." (Meyer.)

Tamarix sp. (Tamaricaceae.) 41413. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "Scrubby plant with spike of heather colored flowers, growing on gravel by stream in bed of glacial valley at elevation of 12,000 feet. Plant 6 inches to 1 foot high, in masses with woolly fruits." (Cooper.)

NOTES ON BEHAVIOUR OF PREVIOUS INTRODUCTIONS.

Amygdalus davidiana (No. 34515). At the Truckee-Carson Experiment Farm, Fallon, Nevada, Mr. Fairchild found a tree 6 feet tall that had hardened its growth, whereas the mahaleb was still green. This tree has withstood alkali better than any other stock at Fallon.

A. davidiana (No. 36664) recently sent to Mr. N. M. Ross, Chief of Tree Planting Division, Forestry Branch, Indian Head, Saskatchewan, Canada, is now 2½ feet high and in promising condition. In this connection it might be noted that *A. davidiana* has attracted the attention of the Oregon Nursery Company. The budders are very much pleased with the way in which it takes the bud. As this Company is budding from one million to a million and one-half plants each year, the discovery of a seedling stock which takes the bud unusually well is a very important item.

Blighia sapida. The Akee has fruited for several years at Miami. The tree in the laboratory grounds there bore a good crop of fruits in February of this year. These February fruits are not so highly colored as those fruiting later. The arillus, however, was of good quality and had a delicate flavor. It is good when eaten raw, or cooked like sweetbreads.

Fraxinus sp. (No. 30414) from Khotan, Chinese Turkestan. When Mr. Fairchild visited the Forestry Branch at Indian Head, Canada, he found this Khotan ash frozen at

the top, but promising to be a success there. He also found this plant doing remarkably well under extremely trying climatic and soil conditions at Fallon, Nevada. Mr. Headley desires as many plants of this ash as he can get.

Macadamia ternifolia has fruited out on the campus at Berkeley, California, and at the Miami, Florida, Plant Introduction Field Station. This shows the range which can be expected of this interesting introduction.

Populus suaveolens (No. 22363) sent to Mr. F. B. Headley, Superintendent, Truckee-Carson Experiment Farm, Fallon, Nevada, leaves out two weeks earlier than any other Populus that he has. A three-year old tree in his possession is 20 feet tall.

Pyrus sp. (No. 26485) A popular pear in Chinese markets described as being of medium size, shaped like the American Bartlett, of yellowish white color, with rather coarse flesh and good keeping quality, has proven very resistant to drying winds and drought at our Introduction Field Station at Chico, California, and is recommended for trial in North and South Dakota.

Ulmus glabra suberosa (No. 34805). An elm purchased from Mr. A. Woeikoff by Mr. F. N. Meyer, which seems to be making excellent growth at the Northern Great Plains Field Station, Mandan, North Dakota. From its more spreading habit and more proliferous branching, it promises to be better adapted for shelter planting than even *Ulmus pumila*.

Ziziphus jujuba. (No. 22683) Bottle jujube from Shansi, China. Mr. F. L. Ramsey of the Austin Nursery Company, Austin, Texas, sent in ripe fruits of this number for three consecutive years. Many of the fruits are as large as full-sized commercial dates.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.
Edward Goucher, Propagator, in charge of Quarantine Greenhouse.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville Md., (Yarrow) Plant Introduction Field Station.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Cartagena, Colombia.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodo no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behaviour in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 115. NOVEMBER 1915.

Genera Represented in this Number.

	Page		Page
Annona	938	Lonicera	941
Barleria	938	Macadamia	941, 943
Benincasa	938	Mimusops	941
Betula	938	Osterdamia	942
Caragana	938, 939	Phoenix	942
Cordeauxia	939	Polygonum	942
Cotoneaster	939	Prunus	943, 944
Dipsacus	939	Pyrus	943
Dumoria	939	Randia	943
Elaeagnus	943	Salix	944
Gaultheria	940	Spathodea	943
Jubaeopsis	940	Zea	944

PROPERTY OF DIVISION OF FORESTRY COLLEGE OF AGRICULTURE UNIVERSITY OF CALIFORNIA

Plates:

Mangifera indica, Cambodiana Mango, natural size.
Amygdalus davidiana, Peach, natural size.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Annona squamosa L. (Annonaceae.) 41464. Seeds of sugarapple from Saigon, Cochin-China. Presented by Mr. P. Morange, Director of Agriculture. "These seeds are known in Cochin-China under the name *Pomme-cannelle du Cap*, 'Cape cinnamon-apple'. The flesh of fruits of this variety presents when ripe a firm texture, with seeds comparatively rare, and does not split open as is the case with the ordinary variety. This peculiarity allows the transportation of the fruit for long distances, and should certainly make its exportation easy." (Morange.)

Barleria cristata L. (Acanthaceae.) 41458. Cuttings from Manila, Philippine Islands. Presented by the Director, Bureau of Agriculture. "Philippine hedge plant, the best in the tropics. I think it never seeds." (O. W. Barrett.) "An erect or diffuse acanthaceous undershrub with the branches and upper surface of the leaves usually yellow-hairy; often compound, dense, ovate spikes of purple, blue, or white flowers. The corolla is about 1½ inches long, the upper half funnel-shaped and spreading into ovate lobes ½ inch in length. Wild everywhere in the lower hills of Northeastern and Central India and probably in the mountains of Southern India also." (Adapted from Hooker, Flora of British India, Vol. 4, p. 488, 1884.)

Benincasa hispida (Thunb.) Cogn. (Cucurbitaceae.) 41492. Seeds of wax gourd from Chungking, China. Presented by Mr. E. Widler. "*Tung Kwa*. A plant 20 to 30 feet long. Grows best in a climate with ranges in temperature from 70 to 110 degrees F.; takes about 6 months to mature; bears yellow flowers and fruits in the autumn. The fruit is 3 feet long and 2 feet in circumference, used only as a vegetable boiled and sweetened. It sells in the market at 25 cash per cattie." (Widler.)

Betula pendula Roth. (Betulaceae.) 41478. Birch seedlings presented by Mr. Norman M. Ross, Forestry Branch, Indian Head, Saskatchewan, Canada. "These seedlings came from seeds picked during the past 2 or 3 years, from trees grown from seed originally obtained in Russia, the plantations being set out in 1908 as two-year-old seedlings. These trees are planted 4 feet apart each way and show a height of from 12 to 16 feet." (Ross.)

Caragana arborescens var. *prostrata* Lam. (Fabaceae.) 41480. Cuttings of Siberian peatree from Indian Head, Saskatchewan, Canada. Presented by Mr. Norman M. Ross, Forestry Branch. "A seedling grown, among thousands of others from seed picked in our ordinary hedges, probably about five years old, has a spread of about four feet. We find that probably one percent of the seedlings show the pros-

trate characteristics. We think that this form can be used very effectively for many kinds of planting in landscape work." (Ross.)

Caragana pygmaea (L.) DC. (Fabaceae.) 41479. Plants from Indian Head, Saskatchewan, Canada. Presented by Mr. Norman M. Ross, Forestry Branch. A low under shrub with reddish-yellow flowers, found in central Asia from Afghanistan eastward to Tibet and Dauria.

Cordeauxia edulis Hemsl. (Caesalpiniaceae.) 41477. Seeds of the Yeheb nut from Aden, Arabia. Presented by Mr. A. G. Watson, American Vice-Consul, who obtained them from the Governor of Italian Somaliland at Mogadiscio. For description see Plant Immigrants, No. 53, December 1-15, 1910. These are the Yeheb nuts which are so highly prized by the Dolbahanta Somalis that they prefer them to rice and dates. They contain 21% of cane sugar and 13% of proteids. Repeated but unsuccessful attempts have been made to secure them during the past 6 years.

Cotoneaster sp. (Malaceae.) 41494. Seeds from Bariloche, Argentina. Presented by Dr. Joseph Vereertbrugghen. "This plant, *espina blanca* (white thorn), which I found in the canyodon Buriloche, is an evergreen belonging, I believe, to the Chilean vegetation. Animals eat it the year around, and like it very much, horses as well as cattle." (Vereertbrugghen.)

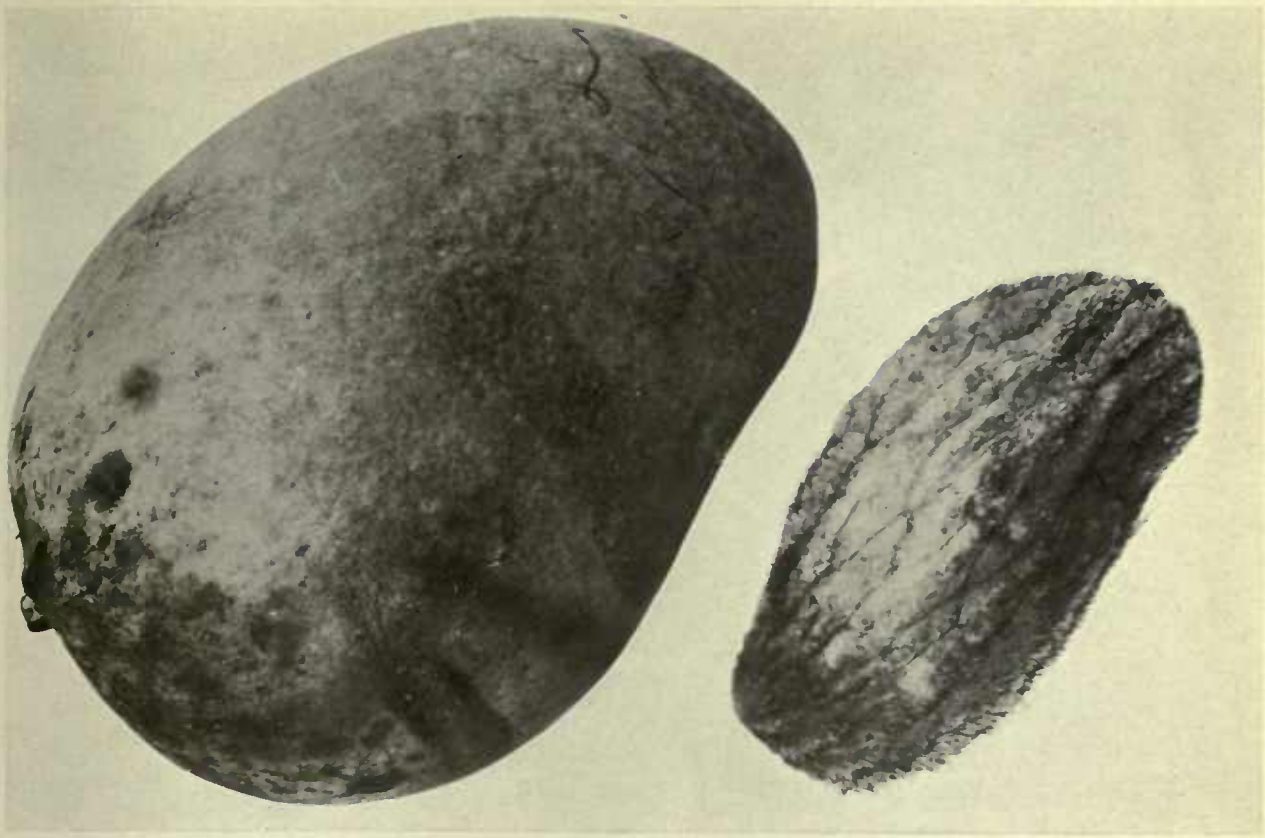
Dipsacus fullonum L. (Dipsacaceae.) 41499. Seeds from Marseille, France. Presented by Mr. A. Gaulin, American Consul General. "The best variety of teasel grown in the Avignon and Department of Vaucluse region. This sample was obtained from Messrs. G. & E. Duckers of Cavaillon, Vaucluse." (Gaulin.)

Dumoria heckeli A. Chevalier. (Sapotaceae.) 41481. Seeds of the *Bako* from Coomassie, Gold Coast Colony, Africa. Presented by Mr. A. E. Evans, Traveling Inspector, Agricultural Department. "A gigantic sapotaceous tree attaining a height of 110-160 feet, with a cylindrical trunk $3\frac{1}{4}$ - $6\frac{1}{2}$ feet in diameter near the base (circumference approximately 10-20 feet), and rising 90 feet or more before bearing branches. Young branches slender, becoming glabrous; and bearing clusters of leaves at the ends. Leaves oblong-lanceolate, attenuate at apex and base, the apex itself often obtuse or sometimes emarginate, papery, undulate margined, glabrous, $2\frac{3}{4}$ - $4\frac{1}{2}$ inches long and 1 - $1\frac{1}{2}$ inches wide. Petioles glabrous, $\frac{3}{4}$ - 1 inch long. Flowers solitary or in small clusters of 2 to 3 in the axils of the leaves. Calyx campanulate. Corolla rotate, greenish-white, $\frac{3}{4}$ inch in diameter, slightly fragrant. Fruit at maturity greenish-yellow, sphero-ovoid, like a russet apple, with

mellow sickening pulp, bitter and nonedible. Geographic distribution - Ivory Coast, Gold Coast, Liberia, in the vast virgin forests. Flowers in May. The timber, reddish with beautiful markings, is one of the best African substitutes for mahogany." (Translation from the original description, Comptes Rendus de l'Academie des Sciences, Paris, Vol. 145, p. 226, 1907.)

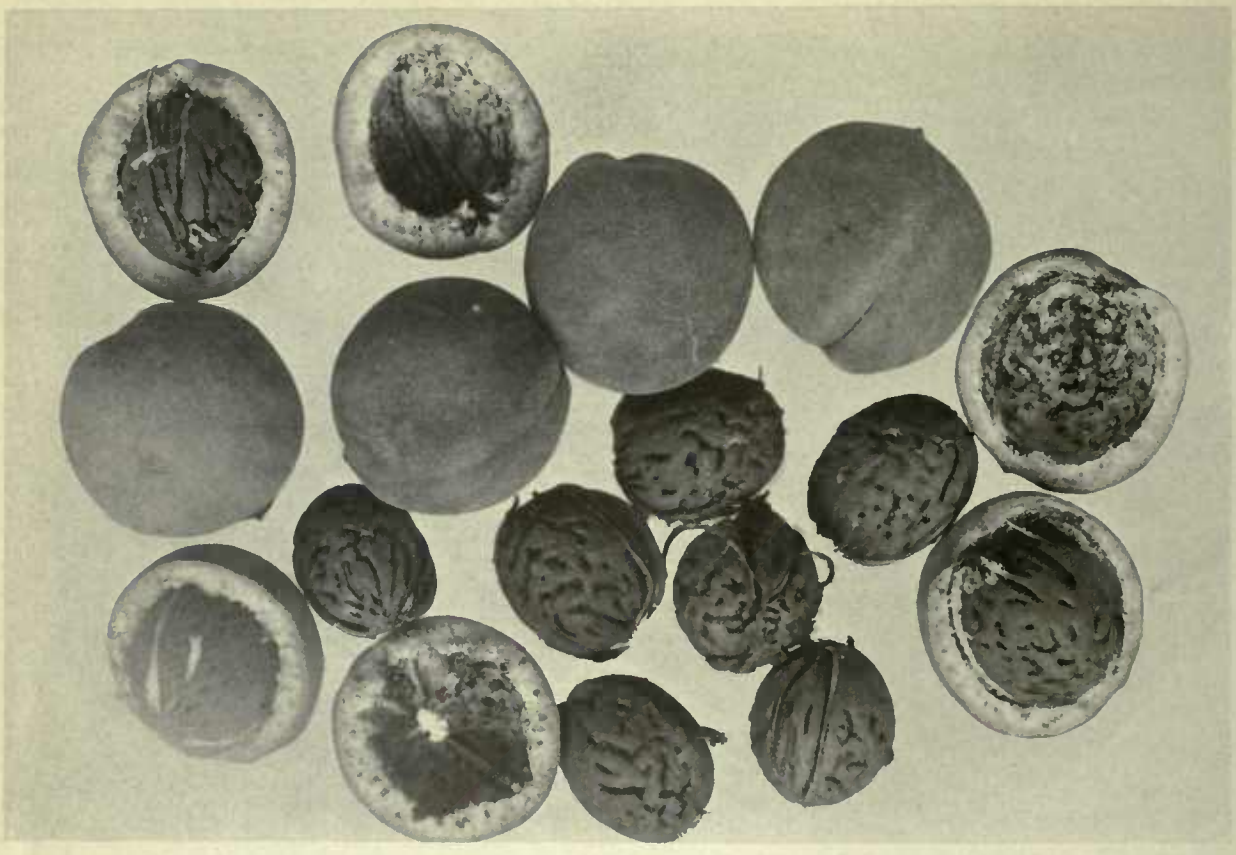
Gaultheria sp. (Ericaceae.) 41556. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper and presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "A low creeping plant on rock surfaces and peaty alpine turf at an elevation of 12,000 feet. Showy blue berries are profuse. This is a much larger plant than the *Gaultheria trichophylla* and exists on exposed rock faces with only a mere suspicion of soil in occasional crevices." (Cooper.)

Jubaeopsis caffra Beccari. (Phoenicaceae.) 41484. Seeds from Johannesburg, Union of South Africa. Purchased from Mr. J. Burtt-Davy, Botanist, Agricultural Supply Association. "I have just learned of the existence of a grove of wild coconut palms along the coast some 70 miles south of Port Shepstone. This appears to be a new species of coconut, adapted to warm temperate conditions; the nuts are said to be smaller than those of the typical *Cocos nucifera*. The fruits have the flavor of coconut, and are much prized by the Pondos, who travel scores of miles to collect and sell them. They are used as food, and I am told for oil." (Burtt-Davy.) "Until quite recently only two genera of palm were known from South Africa. A few years ago Mr. Charles Ross, then conservator of forests at Umtata, reported the occurrence of another kind in Pondoland. This has now been found to be the representative of a new genus, named Jubaeopsis from its nearest ally Jubaea, a monotypic genus of South America (Chili). The fruit of Jubaeopsis differs from that of *Cocos* by the position of the germinating holes, which in the latter genus are situated near the base of the nut, but in Jubaeopsis near its equator. The endosperm is hollow, as in the coconut, and also of a sweetish taste, but without milk. A tree up to 20 feet high, with leaves 12-15 feet long. The staminate flowers are inserted on the upper parts of the branches of the spadix and possess 8-16 stamens, the pistillate flowers being on the lower parts. The fruits are about the size of walnuts, but nearly globular, the fibrous pericarp being yellow when ripe. The palm occurs, as far as known, only at two localities in Pondoland, viz. at the mouths of the Umsikaba and the Umtentu rivers, in both cases on the northern bank and in close proximity to the water. As this



The Cambodiana Mango (S.P.I. No. 8701.)

This variety which was discovered by Mr. David Fairchild in Saigon, Cochin China, in 1902 and introduced in the form of seeds has produced some valuable seedling trees. The fruit represented is from a seedling at the Mayaguez Experiment Station in Porto Rico. Seedlings of the Cambodiana which come reasonably true to type have proven to be early and remarkably sure croppers in Porto Rico, the Isle of Pines, and South Florida. The fruit has its own characteristic flavor which is preferred by some to that of the Indian varieties. It is fiberless, of a golden yellow color, and by many growers is considered a commercial variety because of its regular fruiting habit. It is subject to the attacks of the mango fruit fly in Porto Rico. Natural size photograph, No. 16011, taken by Wilson Popenoe, at Mayaguez, Porto Rico, July 6, 1914.



Fruits and Pits of the Chinese Wild Peach.
(*Amygdalus davidiana.*)

The discovery by Frank N. Meyer that this species of wild peach which produces inedible fruits has been used probably for centuries in China as a stock for many stone fruits has led to its extensive trial for the same purpose in America. Several plantings of commercial peaches, plums, apricots, and almonds budded upon this as a stock have reached bearing age in California and Texas and are unusually promising. Owing to the resistance to cold, drought and alkali of this new stock and the ease with which it can be budded, it appears probable, if supplies of the seed can be raised, that it will form the root system of large commercial peach plantings in California, Utah and Texas. In Oregon the largest nurserymen are attracted by the ease with which it can be worked, and in Minnesota and Iowa trees of it have stood untouched by the low temperatures, even -40° F., which have killed commercial varieties to the ground. It cannot be expected to fruit in any region visited by late frosts, as its buds swell easily in warm, damp weather. Natural size photograph, taken by R. L. Beagles, July 14, 1915, at Chico, Calif., Neg. No. 535.

is, apart from the widely spread coconut palm, the only member of the tribe which occurs in Africa, all the others being American. Its discoverv throws some new light on the origin of the Cocoineae and the relationship of our flora." (Marloth, Flora of South Africa, Vol. 4, p. 48.)

Juniperus cedrus Webb. (Pinaceae.) 41463. Seeds from Tenerife, Canary Islands. Collected by Dr. George V. Perez and presented through the Royal Botanic Gardens, Kew, England. "This valuable tree which is nearly extinct is said to be the quickest growing of all Juniperus. I have carefully watched the growth of some in my garden at Villa Orotava and can report an average of over three feet per year. It begins to seed here within 5 years of planting so that its propagation is easy, at any rate in a suitable climate. If treated in the following manner it germinates much more promptly and abundantly. The seed is to be carefully extracted from the gabuli, the extracted seed should tnen be enclosed in a canvas or calico bag, immersed for 10 seconds in boiling water, finally from the boiling water the bag should be immersed in cold water, then sown preferably in heather earth. It is important that plants of our flora should be tried almost exclusively in southern California and perhaps Florida, for although *Juniperus cedrus* stands frost in its natural habitat at great altitudes there is no doubt that our plants ought to be experimented on in climates like ours, where in the coast region we never have frost, and the rains only occur in the winter months. I do not think you can lay too much stress on the fact that seeds I have sent you should be tried only in southern California." (Perez.)

Lonicera sp. (Caprifoliaceae.) 41560. Seeds of honeysuckle from Bhutan, India. Collected by Mr. R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "A slender bush 6 inches high by stream under Rhododendron and Abies forest at an elevation of 11,000 feet. Has pink, waxy flowers in pairs and very reddish fruits." (Cooper.)

Macadamia ternifolia F. Mueller. (Proteaceae.) 41472. Queensland nuts from Homestead, Florida. Presented by Mrs. L. L. Bow. "You may be interested to know that these nuts make a delicious cake, and I have also used them in sandwiches and salads. My tree is near the laundry and gets a great deal of wash water; it has had very little fertilizer beside the soap suds." (Bow.)

Mimusops elengi L. (Sapotaceae.)41501. Seeds of *Munamal* from Lawang, Java. Presented by Mr. M. Buysmam, Jardin Botanique. "A large evergreen tree, with fleshy leaves, glossy, oval, with nervation slightly emphasized; calyx of

six sepals in two series; corolla rotate with linear appendages; stamens six; six-celled superior ovary; berry with a single seed by abortion. The wood is good for cabinet-making, joinery, and turning. The fruit, which is shaped like an olive, is eaten, but its flavor is not very agreeable. The odorous flowers, which possess astringent and tonic properties, serve for the preparation of a perfume; the red, woody, fibrous bark is astringent, and is used as a febrifuge and a tonic; a decoction is used as a gargle for salivation. The fruits and seeds furnish an oil for burning. The root is astringent." (Lanessan, Les Plantes Utiles des Colonies Francaises.)

Osterdamia tenuifolia (Trin.) Kuntze. (Poaceae.) 41509. Mascarene grass from the Bonine Islands. Presented by Mr. J. B. Thompson, Guam Agricultural Experiment Station. "This grass is used for lawn purposes in Japan and is said to suceed well about Yokohama. It was originally described from the Mascarene Islands. It has been tested in a preliminary way in California, at Biloxi, Mississippi, and at Miami, Florida. The grass makes a very beautiful dark green turf, the leaves being short, never more than an inch or two long, much resenbling the turf of red fescue. Stout rootstocks are produced in abundance and these have a tendency to elevate the turf, a defect which can be remedied by proper rolling. The grass has considerable promise for fine turf and for golf purposes in the South." (C. V. Piper.)

Phoenix farinifera Roxburgh. (Phoenicaceae.) 41507. Seeds of a palm from Matania El Saff, Egypt. Presented by Mr. Alfred Bircher, Middle-Egypt Botanic Station. Habitat, India and South China. A dwarf species, having a stem two feet high, completely enveloped by the leaf sheaths; fronds six feet long, unarmed, pinnate, reclinate, with long, awl-shaped, plicate leaflets; flowers dioecious; spathe poly-valved; spadix erect; fruit a drupe, oval, 1 cm. in length, fleshy, black, hard; stone single, oblong, horny. In Cochin-China the plant goes under the name of Cay-cho-la. The trunk, stripped of its leaves, contains a quantity of certain starch which the poor use in case of need. This palm stands the climate of the south of France without protection. It is adapted to sandy and otherwise dry and barren land, but prefers the vicinity of the sea. (Adapted from von Mueller, Select Extra-Tropical Plants, p. 373; and de Lanessan, Les Plantes Utiles des Colonies Francaises, p. 784.)

Polygonum sp. (Polygonaceae.) 41527. Seeds from Bhutan, India. Collected by R. E. Cooper. Presented by Bees Limited, Liverpool, England, at the request of Mr. A. K.

Bulley. "A clumpy *Polygonum* among stones and peaty spots in gaps in *Rhododendron* forest at an elevation of 13,000 feet. Clump one foot thick or rosette larger. Flower spike large and pendant, rich red, 10 inches long at times. Also seen in rock ledges at its best." (Cooper.)

Prunus sargentii Rehder. (Amygdalaceae.) 41475. Seedlings of Sargent's cherry from New Haven, Connecticut. Purchased from the Elm City Nursery Company. 300 one-year-old seedlings raised from seed obtained from the Arnold Arboretum. To be used in the cherry stock investigation by Department Officials.

Pyrus ovoidea Rehder. (Malaceae.) 41461. Seeds taken from fruit received from the Arnold Arboretum, Jamaica Plain, Massachusetts, where it has never shown signs of pear blight to which disease it may be immune. Growing at the Plant Introduction Field Station, Chico, California, for propagation and testing.

Randia sp. (Rubiaceae.) 41495. Seeds from Orotina, Costa Rica. Presented by Dr. Carlos Wercklé, Trial Grounds, Department of Agriculture. "From the Pacific coast. Is much more beautiful than *Randia aculeata*, but is for hot climate only." (Wercklé.)

Spathodea campanulata Beauv. (Bignoniaceae.) 41500. Seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Gardens. A much branched, West African tree with opposite pinnate leaves, 1 to 1½ feet long, dark green above and paler, somewhat silky beneath in the young stage; large, spreading, terminal racemes of very large showy flowers; corolla at least four inches long and quite as broad. One of the showiest flowering trees of the tropics which has proven hardy in Southern Florida where its masses of large brilliant orange yellow flowers attract a great deal of attention. (Adapted from Curtis Botanical Magazine, 1859, plate 5091.)

NOTES ON BEHAVIOUR OF PREVIOUS INTRODUCTIONS.

Elaeagnus angustifolia. (29225) A large fruited form of the oleaster, called *Djigan*, discovered by F. N. Meyer in Andijan, Turkestan, is doing especially well in the irrigation project area at Fallon, Nevada. In Turkestan the fruits of this variety are sold on the markets and eaten as sweetmeats.

Macadamia ternifolia. (21249) The Queensland Nut. On February 20, 1911, one plant of this species was sent to Mrs. L. L. Bow, of Homestead, Florida, and in September, 1915, she wrote as follows regarding it:

"*The Macadamia ternifolia* (Queensland Nut) sent me in

March, 1911,has become a beautiful tree and last year bore about 25 nuts, - this year it has a very good crop. Would you like to have me send you some nuts by mail?"

We offered to buy the entire crop and she sent us one pound, about one fourth of it, saying -

"I am sorry there are not more, but we have been eating them and giving them away. Please do not offer to pay for them. I am only too glad to send them and hope I can let you have more next year, if you wish them."

To the pound of seed received from Mrs. Bow, the S. P. I. No. 41472 was assigned (see page 941.) For photographs see Label Catalog for 1915-1916, and Plant Immigrants, No. 78.)

Prunus sp. (31652) The Methley plum from Natal, which has attracted attention there because of its earliness and good quality is thought to be a cross between the Satsuma and the myrobalan. Mr. DeVoe, of Tacoma, Washington, reports that a plant sent him February 6, 1913, has grown vigorously. It flowered in 1914 and in 1915 attained a height of six feet, and spread of four feet, and produced a peck of "excellent fruit."

Mr. T. W. McCormack, of Denton, Texas, also states in a letter dated November 29, 1915, regarding this number, that a plant received by him in February of last year, has proved very thrifty, and made fine growth, producing branches over five feet long during the year.

Reports sent from DeLeon, Texas, Vacaville and San Diego, California, are likewise favorable.

The vigorous growth of these young trees in places of such widely different climatic conditions, justifies the recommendation of a thorough trial for this plum throughout the United States.

Salix sp. (22450) A Chinese willow from Pau ting fu, which grows everywhere on the dry lands of North China, made at Fallon, Nevada, a growth of ten feet the first year. Mr. Headley, in charge of the reclamation work, at Fallon, has already distributed a large number of cuttings to settlers on the Project.

Zea mays (9573) Early Malcolm corn. A selection of the Malakoff corn which was introduced by Professor N. E. Hansen, from Russia in 1902, is the only variety which matures regularly in Ottawa, according to information given to Mr. Fairchild last summer. A very sweet variety has been produced by crossing this Early Malcolm with the squaw corn, a low growing variety originated by the Indians of the western plains. A cross between the Early Malcolm and a variety known as the Early Adams, has, in its second filial generation, ripened ten days earlier than either parent.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E R. Johnston, in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Cartagena, Colombia.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodo no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

DIVISION OF FORESTRY
OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 116 DECEMBER 1915

Genera Represented in this Number.

	Page		Page
Baryxylum	946	Lonicera	952
Canavali	946	Malus	948
Carissa	951	Meconopsis	948
Chayota	946	Persea	949
Chrysophyllum	947	Prunus	949
Crotalaria	947	Rheum	952
Eleocharis	947	Sicana	949
Garcinia	947	Tamarix	950
Koelreuteria	947	Theobroma	950
Lilium	948	Wasabia	950
Litchi	951		

Plates:

Jujubes, Zizyphus jujuba, natural size.
Schizandra chinensis?, natural size, S.P.I. No. 40025.
A tropical grape, Vitis tiliaefolia, natural size.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Baryxylum inerme (Roxb.) Pierre. (Caesalpiniaceae.) 41574. Seeds from Little River, Florida. Presented by Mr. Charles T. Simpson. "A large, quick-growing, symmetrical tree, with a spreading top and fine graceful feathery foliage, indigenous to Ceylon and Malaya. The young leaves and shoots are covered with a brown velvety tomentum, from which the tree takes its specific name. The tree flowers twice a year at irregular seasons, some specimens being in blossom while others by its side are in ripe fruit. The flowers are rusty-yellow, sweet-scented, and borne in large erect panicles . Trimen, in his Flora of Ceylon, stated: 'It is a magnificent sight when in full blossom.' It is specially suited to dry districts, but also thrives to perfection in the moist region up to 1800 feet." (Macmillan, Handbook of Tropical Gardening and Planting, 2nd Edition, p. 299.)

Canavali obtusifolium (Lam.) DC. (Fabaceae.) 41619. Seeds from Burringbar, New South Wales, Australia. Presented by Mr. B. Harrison. "A native bean growing on the beach or sea coast here with pink flowers, the vines of which grow to the length of 20 or 30 feet. It is regarded as a poisonous plant by some writers, although it is said to be good poultry food." (Harrison.)

Chayota edulis Jacq. (Cucurbitaceae.) 41573, 41625-41626. Chayotes from Camaguey, Cuba. Presented by Mr. Robert L. Luáces, Director Granja Escuela. No. 41573. "Four chayotes of the green variety. Of these four, one has been sprouted off the vine and the others on the vine. We here in Cuba either sprout the fruits on the vine or over water, that is taking the chayote from the vine and putting it in the mouth of a wide mouthed bottle until it sends out the sprout. It is also common to cut off the lower end of the fruit before planting and allowing the wound to heal over either simply in the air or covering the wound with ashes. I send one chayote sprouted off the vine and in the air so that you may see how it changes somewhat in shape. Keep one of the fruits this way so that you may see just how much it will shrink, in sending out the bud, before drying up, for I believe that some of the varieties shown in the Porto Rico bulletin (Bulletin No. 28, Division of Botany) can be accounted for in this way."(Luáces.) No. 41625 is white and No. 41626 a long green variety.

Chayota edulis Jacq. (Cucurbitaceae.) 41621, 41627-41628. Chayotes from Orotina and San Jose, Costa Rica. Presented by Dr. Carlos Wercklé, Department of Agriculture. The fruits of these three varieties are light green, round white, and spiny, and round green, and spiny, respectively.

Chrysophyllum sp. (Sapotaceae.) 41648. Seeds from forests of Rio Contas, Bahia, Brazil. Presented by Mr. H. M. Curran. "Sapotaceous fruit wild in forest. Trees not seen. Has a thin, tough skin and soft light yellow flesh with a texture much like that of a ripe persimmon. The flavor of the fruit is slightly acid and very agreeable. One of the best forest fruits I have ever eaten." (Curran.)

Crotalaria cunninghamii R. Brown. (Fabaceae.) 41571. Seeds from Wellington Point, near Brisbane, Queensland, Australia. Presented by Mr. James Pink. "I am of the opinion that under cultivation it will prove an acquisition for ornamental planting and in dry situations it may prove a rival to the herbaceous *Calceolaria*. The plant grows about two feet high and will bear topping to any extent, every lateral throwing up a spike of flowers of bright orange yellow." (Pink.) "Though unattractive as to the colour of the flowers, this is a very curious and striking greenhouse plant, the soft velvety pubescence that clothes all the surfaces with a uniform glaucous hue at once arresting the attention. It is a native of the dry, almost desert regions of North-western and Central Australia, growing on sandy ridges, from Shark's Bay to the Gulf of Carpentaria, and penetrating southwards through Central Australia towards Spencer's Gulf. A shrub two to three feet high, everywhere covered with a soft grey-green tomentum." (Curtis's Botanical Magazine, pl. 5770.)

Eleocharis tuberosa (Roxb.) Schultes. (?) (Cyperaceae.) 41680. Bulbs or corms of *apulid* from Manila, Philippine Islands. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture. Of a somewhat similar form or perhaps species, Mr. F. N. Meyer says "They are mostly eaten raw, but are also sliced and shredded in soups and in meat and fish dishes. Foreigners in China grate them and serve them boiled as a winter vegetable, in which state they resemble sweet corn very much in looks and taste. The plants need a hot summer to mature and are grown on a muck or clayey soil with several inches of standing water on top, very much in the same manner as wet land rice."

Garcinia sp. (Clusiaceae.) 41622. Seeds from Brazil. Presented by Mr. H. M. Curran. "Species cultivated in Rio de Janeiro Botanical Gardens. Trees 30 to 40 feet high, 16 to 18 inches in diameter, with heavy crop of large fruit, approximately 2 inches in diameter, with yellow acid flesh. Probably a common variety from India." (Curran.)

Koelreuteria formosana Hayata. (Sapindaceae.) 41679. Seeds from Taihoku, Formosa. Presented by Mr. Genjiro Takata, Chief, Bureau of Productive Industry. An indigenous Formosan tree related to *K. bipinnata* Franch., but dif-

fering from that species in having subentire leaflets. A small, handsome tree with bipinnate leaves, and terminal spreading clusters of yellow flowers.

Lilium sp. (Liliaceae.) 41585. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper and presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "Grows on turf in rock ledges at an elevation of 13,000 feet. Flowers reddish green hanging bell-like on 6-inch stem." (Cooper.)

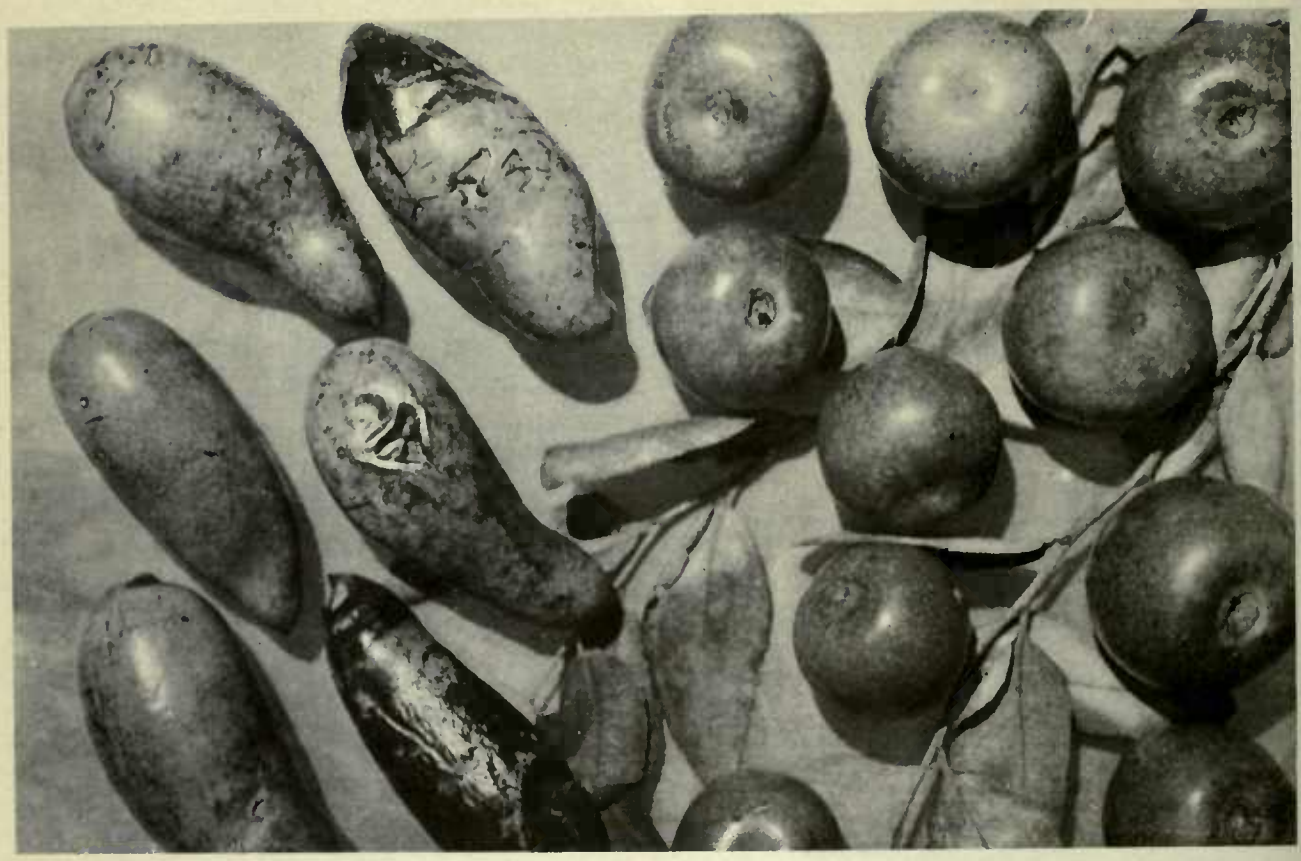
Malus sargenti Rehder. (Malaceae.) 41572. Seeds from Tokyo, Japan. Presented by Dr. T. Watase, Tokyo Plant, Seed and Implement Company. "A shrub of bushy habit 3 to 5 feet high; young shoots downy. Leaves ovate or oval, 2 to 3 inches long, 1 to 2 inches wide; pointed at the apex, rounded or slightly heart-shaped at the base, often three-lobed, sharply toothed; wooly when quite young, becoming nearly smooth before falling; stalks downy, 1/3 to 1 inch long. Flowers pure white, 1 inch across, produced in clusters of five or six, each on a stalk 1 to 1-$\frac{1}{4}$ inches long; calyx smooth outside, wooly within. Fruit orange shaped, $\frac{1}{2}$ inch wide, bright red, the apex marked by the scar of the fallen calyx. I only know this species by a small specimen sent to Kew by Professor Sargent in 1908, but it appears to be a pretty plant, and distinct among crabs by its purely bushy habit. It was originally discovered by Sargent in 1892 near a brackish marsh, Mororan, Japan, and was named in his honor by Mr. Rehder in 1903. The author observes that it is most nearly related to *P. toringo*, but differs in its larger, pure white flowers with broad overlapping petals and in its larger fruits. From another ally, *P. zumi*, it is distinguished by its broader, often lobed leaves, the shape of the (broader based) petals, the glabrous calyx-tube and the habit." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, Vol. 2, p. 293.)

Meconopsis horridula Hook. f. & Thom. (Papaveraceae.) 41582. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper of Mr. A. K. Bulley. "A many stemmed plant 6 inches high, at an elevation of 14,000 feet on peaty turf over scree. Flowers blue, large; plant prickly." (Cooper.) The genus Meconopsis is made up of poppy-like annuals and perennials with blue, yellow or purple flowers. They may succeed in the mountain regions of the west.

Meconopsis lyrata (Cumm. & Prain) Fedde. (Papaveraceae.) 41592. Seeds from Bhutan, India. Collected by Mr. R. E. Cooper and presented by Bees Limited, Liverpool, England, at the request of Mr. A. K. Bulley. "A yellow flowered herb three feet high at base of rock cliffs in soil similar

Jujube. Zizyphus jujuba. Natural size.

An attractive looking large variety of jujube, of light mahogany-brown color, sold on the streets of Sianfu under the name *Tsui tsao*, which means "fragile jujube." This variety is eaten only when fresh; it is said not to be suited for drying or candying. Of medium sweet taste. Photographed in Sianfu, Shensi, China, August 30, 1914, by Frank N. Meyer. Photograph No. 13120.



Jujubes. Zizyphus jujuba. Natural size.

Two extreme forms of jujubes. To the left a very elongated one of yellowish-brown color, called "chi hsim tsao," meaning "chicken's heart jujube." On the right a round, compressed variety of dark mahogany-brown color, called "Tien tsao," meaning "sweet jujube." Photographed in Sianfu, Shensi, China, August 30, 1914, by Frank N. Meyer. Photograph No. 13123.

to that of *Abies* forest at an elevation of 11,000 feet." (Cooper.)

Persea americana Miller. (Lauraceae.) 41578-41580, 41629. Seeds of four varieties of avocado from Guatemala City, Guatemala. Presented by Mr. William Owen, American Vice-Consul in Charge. No. 41629. "Seeds from a very large aguacate, which I consider the finest product of Guatemala in that line. They are high grown, which will enable the tree to better thrive in a northern climate. Aguacate trees are not numerous in immediate neighborhood of this city. I am compelled to depend almost entirely upon the goodness of distant friends." (Owen.)

Prunus microlepis smithii Koehne. (Amygdalaceae.) 41566. One cherry tree from Colchester, England. Procured from Messrs. R. Wallace & Company. "Under the erroneous name of *P. miqueliana* this cherry has been cultivated in this country for some three or four years, and has created a good deal of interest because of its flowering from November onwards. Owing probably to the excessive mildness of the late autumn of 1913, it made a very charming display at that time. When it was in flower it was sent to Professor Koehne at Berlin, the leading European authority on this genus, and he pronounced it to be a many-petalled form of his *P. microlepis*, originally described in Plantae Wilsonianae, I, p. 256 (1912). Normally, this cherry has five petals to each flower; for this form, which has 10 to 15, Professor Koehne suggests the varietal name *Smithii*, to associate with the plant the name of Mr. T. Smith, of Newry, who introduced it from Japan. It is a deciduous small tree with ovate-lanceolate, acuminate leaves, sharply serrate (the teeth gland-tipped), 1-½ to 3-½ inches long, hairy on both surfaces. Flowers, pale pink, 1 inch wide; the petals obovate, often notched at the apex. Stamens white with yellow anthers; style glabrous. Calyx, glossy green, glabrous, tubular at the base, with five reflexed, ovate lobes ⅛ inch long, toothed, pointed." (Kew Bulletin.)

Prunus sp. (Amygdalaceae.) 41577. Cuttings from Kyoto, Japan. Presented by Miss E. R. Scidmore, Yokohama, Japan. "*Yama Zakura* (mountain cheery), the Giou cherry tree in Maru yama Park (Sea mountain park), Kyoto. It is a drooping variety and these cuttings must be grafted on a drooping variety to get good results." (Scidmore.)

Sicana odorifera (Vell.) Naud. (Cucurbitaceae.) 41665. Seeds of a melocoton from Brazil. Presented by Mr. H. M. Curran. "Common half-wild yellow-fleshed melon of negro clearings, mountains Rio Contas, 12 to 14 inches long, 3 to five inches in diameter. Exterior reddish. Flesh tough and not very palatable. A strong grower which climbs on trees in clearings." (Curran.)

Tamarix dioica Roxburgh. (Tamaricaceae.) 41624. Seeds of a tamarisk from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanic Gardens. "A small tree. Branches with drooping extremities; ultimate branchlets elongate, patent-fastigiate. India and Burma." (Hooker, Flora of British India, Vol. 1, p. 249.)

Theobroma cacao L. (Sterculiaceae.) 41666-41670. Seeds of cacaos from Brazil. Presented by Col. Manoel Couros through Mr. H. M. Curran. Nos. 41666-41667. "Var. *Para*. These seeds are from the largest and most perfect fruits found in a young vigorous plantation on new soil, mountains of Rio Contas. They represent the best type of cacao grown in this region. Rio Contas basin is one of the big cacao regions and produces fine quality cacao beans." No. 41668. "Egg shell variety. A small form of fruit with thinner shell and few seeds. Occurs in all plantations but not selected for planting as the yield is less. From a young vigorous plantation on new soil, mountains of Rio Contas." Nos. 41669-41670. "Var. *Para*. Cacao called *Maranhao*. Probably the same as S.P.I. Nos. 41666 & 41667, though preferred by certain planters. Large perfect fruits selected by Col. Manoel Couros from trees on his plantation were the source of these seeds." (Curran.)

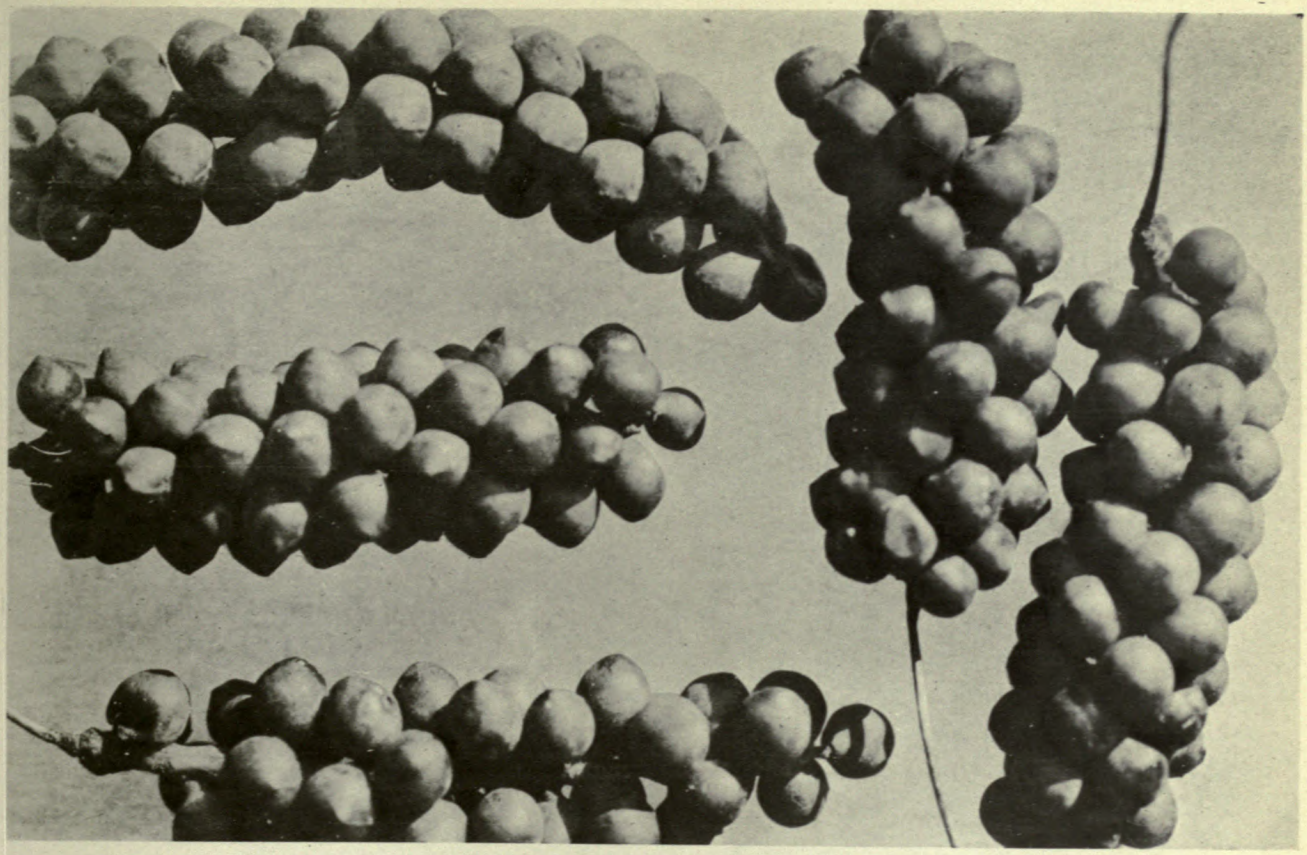
Wasabia pungens Matsumura. (Brassicaceae.) 41567. Roots from New York City. Presented by Mr. H. Terao. "Before cooking the graded wasabi is usually beaten on a dresser with the back of a knife so that the root-cells may be mostly broken up, as you have perhaps learned in Japan. It is said that there is no wasabi for sale in New York City yet. Two Japanese restaurants here get 50 roots a year from San Francisco, where the wasabi comes from Japan." (Terao.)

NOTES FROM CORRESPONDENTS ABROAD.

Mr. F. J. Wiens China M. B. Mission, writes from Shonghong via Swatow, March 7, 1916:

"I recall my promise from last summer to send to you some of the native water chestnuts which seem to be quite an article of export here.

"I now take pleasure in sending under separate cover some samples and trust that it will not be so cold any more in the states through which they have to go that they will freeze. The natives plant them here in June, (but it will have to be earlier where it is not so warm. This is more a fruit for warm climate) and then they are not put right into the ground but they take sand and plant them in wet sand so that the point sticks out of the sand and then they



Schizandra chinensis?, Natural size, S P.I. No. 40025.

"Clusters of ripe fruits, growing on a slender, woody vine found between tall scrub on shady places. The carmine-red berries are of the size of currants and possess a sub-acid, spicy, aromatic taste but the last somewhat too pronounced to make it readily acceptable to the majority of people. The Chinese are very fond of it and claim it has medicinal virtues, being a blood-purifer. The plant deserves to be experimented with as an ornamental cover-vine on shady places. Chinese name "Wu wei tzu;" meaning "fruit of five tastes." Photograph taken at Paoki, Shensi, China, Sept. 12, 1914, by Frank N. Meyer.

A tropical Grape, Vitis tiliaefolia.

A good grape suited to strictly tropical conditions is not yet in cultivation. In this Cuban species we may have a fruit which through selection or hybridisation can be developed into a splendid table fruit. In its present wild form, as here shown, it is a fruit of sufficient horticultural value to merit attention. The berries are deep purple, and of rather acid flavor, suitable for jelly making, but scarcely for dessert. Two strains occur in Cuba, one with large, loose clusters, here shown, and another with smaller, very compact clusters of berries. Photograph natural size, by Wilson Popenoe, Herradura, Cuba, July 19, 1914 (P16053FS.)

sprout in constantly wet sand and after about three or four weeks they are taken cut and planted into the water fields like the rice. They want good manured fields and always covered with water then they spread like potatoes in the ground and in the fall they are dug up after the water is drained off.

I also send you some seeds of a kind of a turnip the English name however I could not learn till now. The edible part is the root and it has a sweet and delicious taste. The seeds are planted or sown in April or May and the flowers when they come are all cut down except those wanted for seeds and in fall also dug up. Now I do not know whether you will not have this latter kind already but if so just throw the seeds away and be done with it. The natives tell me the seeds are very poisonous."

NOTES ON BEHAVIOR OF PREVIOUS INTRODUCTIONS.

Carissa grandiflora. This handsome shrub, which is considered one of the best hedge plants in Natal, South Africa, is rapidly becoming very popular in South Florida, not only because of its spiny character which makes it an impenetrable hedge, easy to grow, but because of its large white fragrant flowers and brilliant red edible fruit. Mr. Bisset, when at Mr. C. P. Taft's place at Orange, Cal., wrote as follows:

"Mr. Taft has a *Carissa grandiflora* that is bearing a fine crop of beautiful, large-sized fruits. This is the first time I have seen the Carissa bearing a good crop of fruit in California. This bush was frozen back when the temperature was 27 degrees last year."

For photographs see Label Catalogue for 1915-1916.

Litchi chinensis (21204). Excerpts from Mr. Bisset's notes on a visit to Tampa, Fla., August 14th.

"On August 17th I visited Mr. W. S. Taylor's place to see the Litchi trees. I found them in excellent condition. The tallest one is 31 inches in height by 50 inches in spread. The trees are planted in a hollow where they get all the rain-fall and the drainage into the basin from the land close by. They are protected by buildings and tree growths. If the frost does not injure them or if Mr. Taylor protects these trees from it, he may succeed in fruiting this Litchi in the vicinity of Tampa.

"After looking over Mr. Taylor's Litchi trees, I went to see Dr. Richardson's place on Bay Shore Boulevard, where another plant of Litchi was growing. This plant is 5 feet 6 inches in height, with straight stem, unlike Mr. Taylor's

plants, which were rather spreading and low, being wider than high. The plant looked well; the leaves were large and healthy, of good color, and seemed to be in excellent health."

For photographs of Litchi see Label Catalogue for 1915-1916 and Plant Immigrants Nos. 111 & 112.

Lonicera maackii (391.) A honeysuckle brought from Russia by Hansen in 1898. A cutting from original plants of this number, planted by Mr. Bisset in 1912, bloomed the following year and has bloomed each succeeding year, and now forms a beautiful, rapid-growing shrub with spreading branches and deep green leaves on the axils of which are borne the clusters of trumpet-shaped flowers which are white on first opening but rapidly turn yellow. This is certainly a precocious flowering species.

For photographs see Plant Immigrants No. 74 and the Label Catalogue for 1915-1916.

Rheum rhaponticum (20420.) A species of rhubarb introduced by Mr. Meyer from the Agricultural Station of Khabarovsk, Siberia, in 1907. We have just received an interesting letter from Mr. A. Merritt, Hollis, L. I., regarding this number, a portion of which is quoted below:

"A little over three years ago I asked for and had sent to me a root of Siberian rhubarb. This turned out to be a most delicious plant of a taste much more delicate than any other rhubarb I have ever eaten or been able to secure. Another unusual feature of it was that it is almost 'sweet' enough to eat without the addition of sugar. We use only about one-sixth as much sugar to sweeten it as the ordinary rhubarb calls for under the same circumstances.

"The plant does not seem to spread, however, as does the ordinary rhubarb, and I have been afraid to make any experiments for fear of losing the one plant that I have and I am wondering whether you could tell me how to propagate from this plant and whether you could send me another root of this same rhubarb."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.

Staff of Field Stations.

R. L. Beagles, Assistant Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
E. R. Johnston, in charge of Brooksville Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Cartagena, Colombia.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Alloteropsis semialata (R.Br.) Hitchc. (Poaceae.) 41751. Seeds of silver grass from the Australian Exhibit at the Panama Pacific International Exposition, San Francisco, California. Procured by Mr. Roland McKee. "White-topped grass, good pasturage, 2 feet." (McKee.)

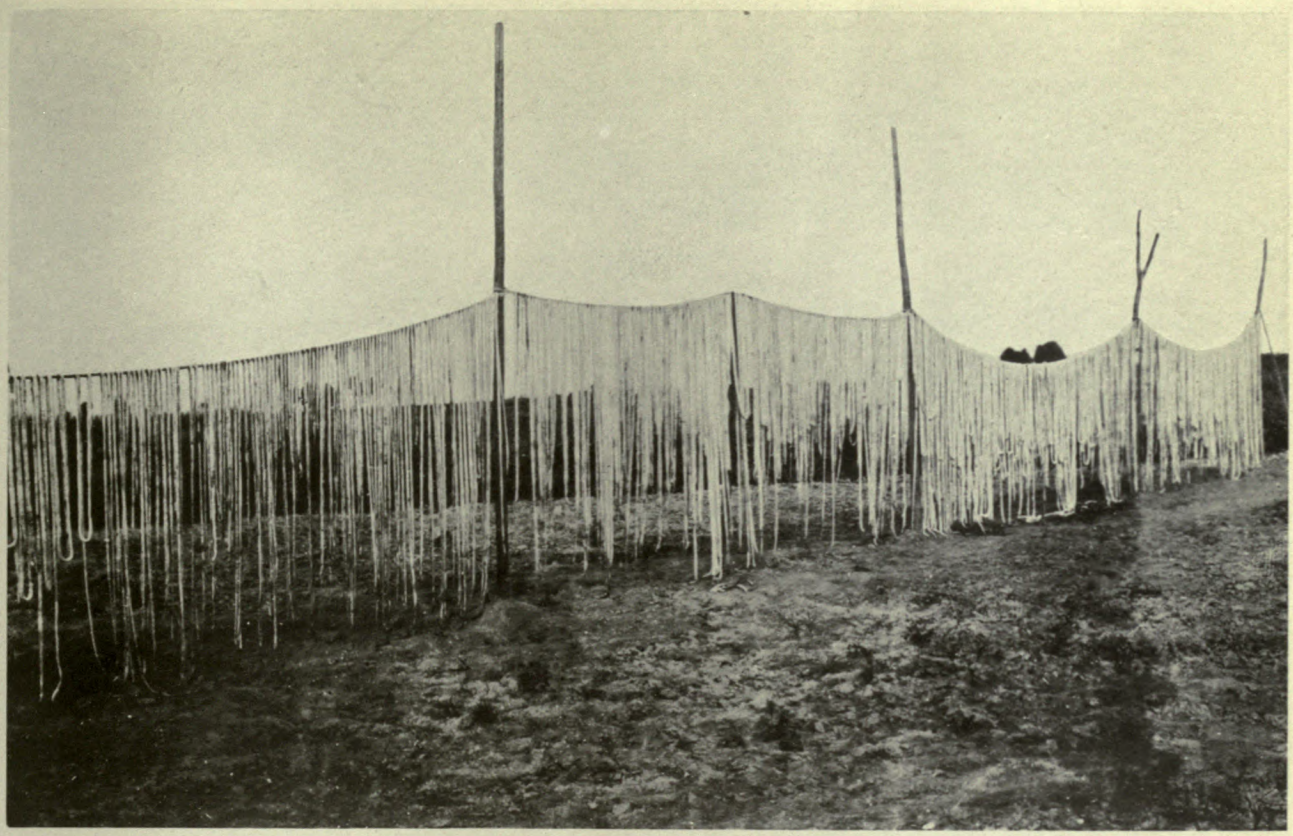
Amygdalus tangutica (Batal.) Korsh. (Amygdalaceae.) 41708 & 41709. Rough and smooth shelled seeds of Tangutian almond received from Taochow, Old City, Kansu, China. Presented by Rev. C. F. Snyder, at request of Mr. F. N. Meyer. "A variable species of bush-almond and though its kernels are bitter and it throws up a lot of stems and is spiny, still I believe it has a decided value as a factor in breeding experiments, for it seems to be very hardy and drought resistant. One finds it mainly on sheltered rocky and loess slopes at elevations from 4,000 feet up to about 10,000 feet above sea. In these higher regions, however, it does not get as cold as one would surmise, for the mountains all around keep off the intense cold. As a stock for almonds and for other stone fruits, I scarcely would recommend this Tangut almond, since it suckers badly and since these suckers are very hard to remove." (Meyer.)

Chamaedorea tepejilote Liebm. (Phoenicaceae.) 41705. Seeds of a palm from Zacuapam, Vera Cruz, Mexico. Presented by Dr. C. A. Purpus. "The undeveloped flower makes an excellent vegetable and is eaten in the State of Vera Cruz everywhere. Besides this, it is a fine little palm. Shady places." (Purpus.)

Chayota edulis Jacq. (Cucurbitaceae.) 41800-41801. Seeds of large white and large green varieties of chayote from Adjuntas, Porto Rico. Presented by Mr. Bartolomé Barceló. "These varieties produce well in this country on the borders of ravines in cool places, as in pits, and they are best produced in cool places which have a stream of water. In such places they yield abundantly. The white variety is more appreciated than the green. Here they are used for salads and the country people also feed them to pigs." (Barceló.)

Corylus ferox Wallich. (Betulaceae.) 41812. Hazel seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Lloyd Botanic Garden. "This is a small tree native of Nepal and Sikkim found growing at altitudes ranging from 8,000 to 10,000 feet. The fruit which has an edible kernel is covered with a prickly cup. The wood is pinkish-white in color, moderately hard and even grained." (Watt's Dictionary of the Economic Products of India.)

Diospyros kaki L. f. (Diospyraceae.) 41691-41702, 41779-41793. Cuttings of 27 varieties of persimmon from Okitsu, Japan. Presented by Prof. I. Ishiwara, Horticultural Experiment Station.



Dried Strips of Watermelon, Citrullus vulgaris.

Strips of a hard-fleshed variety of watermelon hung on lines to dry in the sun and air. After they are sufficiently dessicated they are cut up in short pieces and pickled in brine, in syrup, or made into glace sweets. Photograph taken by Mr. F. N. Meyer, near Chiang po, Shensi, China, August 17, 1914. (Neg. No. P13183FS.)

Fresh Mung Bean Sprouts, Phaseolus radiatus.

A cartload of tubs filled with bean sprouts produced by sprouting the mung bean. These bean sprouts are eaten as a vegetable when scalded, and they are a very tasteful product indeed when served either hot with cut-up meat or cold as a salad with some soybean sauce and vinegar sprinkled over them. Photograph taken by Mr. F. N. Meyer at Peking, China, June 28, 1913. (Neg. No. P13019FS.)

PROPERTY OF DIVISION OF
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

Garcinia mestoni F.M.Bailey. (Clusiaceae.) 41802. Cuttings of Meston's mangosteen from Cairns, Queensland, Australia. Presented by Mr. G. Williams, Department of Agriculture and Stock. An erect, slender, graceful tree 20 feet or more high; with drooping branches; opposite, narrow lanceolate, glossy, dark green leaves; white flowers; and globular fruit possessing a sharp, pleasant, acid flavor. (Adapted from A Synopsis of the Queensland Flora, 3rd Supplement, 1890.)

Laurocerasus acuminata (Wall.) Roemer. (Amygdalaceae.) 41813. Seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Lloyd Botanic Garden. A laurel cherry from the eastern Himalayas and Assam, at elevations of 4,000 to 7,000 feet, with thin dark bark and reddish brown wood.

Lilium giganteum Wallich. (Liliaceae.) 41687. Seeds from Boulder, Colo. Presented by Mr. Theo. D. A. Cockerell. "Seeds of a lily sent by Mr. J. Henry Watson, Manchester, England. They were grown in 1915 by Sir Herbert Maxwell, of Wistownshire, Scotland. This is a very fine thing, as I know from photographs sent by Mr. Watson of plants growing in his garden." (Cockerell.)

Linum usitatissimum L. (Linaceae.) 41811. Flax seed from Lawnton, Queensland, Australia. Presented by Mr. Reginald W. Peters, Director, Experimental Grounds, at the request of Mr. Leslie Gordon Corrie, Brisbane, Australia. "This seed is the result of several years hybridization and selection in England for length of unbranched fiber and absence of tillers at base." (Peters.)

Macadamia ternifolia F.Muell. (Proteaceae.) 41808. Seeds of the Queensland nut from Honolulu, Hawaii. Presented by Mr. C. S. Judd, Board of Commissioners of Agriculture and Forestry. "These grew in Honolulu on introduced trees from either Queensland or New South Wales, Australia, brought here about thirty years ago. The fruit on these trees ripens almost throughout the whole year. Younger trees of this species in Honolulu begin to bear at eight years from planting and they are readily started from the nuts. The leaf of the tree, which seldom attains a height of more than thirty feet in these islands, is a dark green, very shiny and resembles the leaf of the eastern chestnut oak. There are only a few bearing trees in Honolulu, and the nuts from these are roasted in the same manner as salted almonds and are used on the table for the same purpose. They are crisp and tender and in my opinion far excel salted almonds." (Judd.)

Mimusops elengi L. (Sapotaceae.) 41809. Seeds from Port Louis, Mauritius. Presented by Mr. G. Regnard. "The fruit of this species is edible and commonly eaten by young

In a letter received from Mr. I. M. Karzin, Issyl-kul, Akmolinsk Government, Siberia, dated March 22, 1916;

"Many thanks or the seeds sent of American plums, of which *Prunus americana nigra* proves fully resistant to the Siberian climate. This plum, sent in fall of 1913, gave splendid growth and endured very well the severe winter of 1914-1915, with frost down to -40 degrees R."

NOTES ON BEHAVIOR OF PREVIOUS INTRODUCTIONS.

Amygdalus davidiana. Mr. Marsden Manson, San Francisco, Calif., in a letter dated May 20, 1916, says: "*Amygdalus davidiana* is by far the best and hardiest stock I have ever known and its introduction has repaid the support of the Bureau of Plant Industry for several years. Peaches and nectarines on *A. davidiana* are growing and bearing well for young trees."

Amygdalus persica. 33219. *Vainqueur* Peach. Fruits of this variety were sent in to this office on June 5th, and referred to the office of Pomological Investigations. Mr. Wight of that office, reports as follows: "This peach compares very favorably in quality with other early varieties, such as Alexander, Amsden and Sneed; and since it is earlier than the Alexander, it may have considerable value as an early peach, at least for local markets; and I think it also has considerable value as breeding material for production of an early peach of still better quality. The flesh next the stone has a slightly bitter taste, but this might not have been prominent if the specimens could have been well ripened on the tree, as they were picked rather green in order to send them successfuly so far in a mailing box." Mr. R. L. Beagles, in charge of the Plant Introduction Station at Chico, Calif., reports that this variety ripened its fruits about ten days earlier than the Alexander, the most widely grown, early, commercial peach of the Pacific States, and is therefore likely to prove a very valuable peach.

Ilex cornuta. 22979. Holly. From F. N. Meyer, of Soochow, Kiangsu, China. Mr. Meyer sent in the following note with this form: "A very ornamental bush or small tree, loaded in winter with scarlet berries. A slow grower and probably not hardy North. Chinese name *Ta hu tse*." At the Plant Introduction Garden, at Chico, this form has succeeded admirably and promises to be one of the best hollies for regions where the winter is not too severe. Probably it would do well from Washington south.

Juniperus chinensis. 18577. Chinese Juniper, - a columnar form. From F. N. Meyer, Shan-hai-kwan, China. Trees

A Grove of the Chinese Pistache, Pistacia chinensis.

A large and extended grove of Chinese pistache trees planted as a burial grove to a neighboring village. The dense, dark-green foliage, relieved here and there by a few canary-yellow tinted branches, contrasts vividly with the brown and barren hills around. Carefully planted beds of garlic in foreground. Photograph taken by Mr. F. N. Meyer at Tsai chia pu, Shensi, China, September 9, 1914. (Neg. No. P13155FS.)

An Old Chinese Pistache, Pistacia chinensis.

Near view of the enormous trunk of a Chinese pistache tree, measuring 16 feet in circumference, showing the size this species will reach. This is possibly one of the largest specimens in existence and is doubtless several centuries old. Trees of this species are now growing satisfactorily in various places in the United States. An avenue of them was planted at the Chico, Calif., Garden in 1911. Photograph taken by Mr. F. N. Meyer at Tsai chia pu, Shensi, China, September 9, 1914. (Neg. No. P13155FS.)

at the Plant Introduction Station, at Yarrow, Md., are at present about 12 feet high, nearly cylindrical in shape and only about 18 inches in diameter. The dense foliage is of a glaucous, green color. This is one of the best of the junipers of recent introduction and promises to be an ornamental of very considerable value. This tree is now being grown by several nurseries, namely: Bobbink & Atkins, Rutherford, N. J.; Cottage Gardens Co., Queens, N. Y.; and Andorra Nurseries, Chestnut Hill, Pa. It will probably be offered for sale by them in a short time.

Mangifera indica. 8730. Paheri Mango. From Bombay, India. Received through Messrs. Lathrop and Fairchild. An oval, plump fruit, weighing about 10 ounces; of dull yellow color, blush red around the base. The flesh is orange, nearly free from fibre, and of very rich, spicy flavor. Some authorities consider it the best flavored mango of Bombay. This mango is showing considerable promise at the Plant Introduction Station at Miami, from whence splendid fruits have been sent to this office.

Mangifera indica. 11645. Cambodiana Mango. From Mr. M. E. Haffner, Saigon, Cochin China. A long, compressed, beaked fruit, about 8 ounces in weight and deep yellow in color. This office has received from the Plant Introduction Garden, at Miami, fruits of this excellent Indian mango, which is said to be more productive than most other Indian varieties. These fruits were of the finest quality. Owing to the free-fruiting habit of the tree, it promises to be one of the best mangoes for Florida.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco. Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

PROPERTY OF DIVISION OF FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 118. FEBRUARY 1916.

Genera Represented in this Number.

	Page		Page
Aesculus	962	Juglans	966
Andropogon	962	Linum	966
Apluda	963	Passiflora	966
Cariniana	963	Pinus	967
Cenchrus	963	Piratinera	967
Chionachne	963	Prunus	967
Chloris	963	Sesban	968
Chrysopogon	964	Solanum	968
Crataegus	964	Styrax	969
Eragrostis	964	Thelepogon	969
Escallonia	965	Tricholaena	969
Indigofera	965	Virola	970
Iseilema	965	Vitis	970

Plates:

The Tangsi cherry, Prunus pseudocerasus.
Plant of Garbanzo, Cicer arietinum.
Chinese wet-land ginger, Zinziber officinale.
A grove of the Tamopan Persimmon, Diospyros kaki.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Aesculus plantierensis Andre. (Aesculaceae.) 41961. Cuttings of a hybrid horse-chestnut from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. "A hybrid raised in the nursery of Messrs. Simon-Louis Fréres, at Plantières, near Metz; its parents no doubt *A. hippocastanum* and *A. carnea*. The seed came from the former, so that it is (if the generally accepted parentage of *A. carnea* be correct) three-fourths common horse-chestnut and one part the red buckeye (*A. pavia*). It shows the character of both its parents in the leaf; the leaflets being stalkless, as in *A. hippocastanum*, yet showing the strongly ridged and uneven surface of *A. carnea*. In shape and size the panicle is like that of *A. hippocastanum*, but the whole flower is suffused with a charming shade of soft pink, which it inherits from the other parent. In habit and general appearance it is intermediate. It has flowered at Kew for several years past, and I consider it a very beautiful and desirable acquisition. It has developed no fruit at Kew, and I understand from Mr. Jouin, of Plantières, that it does not bear seed in the nursery. For public places this is an advantage." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, Vol. 1, p. 173.)

Andropogon spp. (Poaceae.) 41885-41891. Grass seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. 41885. *A. annulatus* Forsk. "An abundant, native perennial grass in India, much used for fodder, both the yield and quality being good. It belongs to a group of species which are closely interrelated, but all furnish fairly good forage. The species are well adapted to Gulf Coast conditions and are at present the subject of careful investigation as the best of them will probably be worthy of cultivation. *A. annulatus* is a wide-spread species over Africa and southern Asia. The vernacular name commonly used in Punjab is *palwan*. Closely related species are *A. pertusus* (the sour-grass of Barbados), *A. caricosus*, and *A. bifoveolatus*." (C.V.Piper.) 41886. *A. caricosus* L. "A species much like the preceding and of similar value. Introduced in Antigua where it is valued as a hay grass." (Piper.) 41888. *A. lawsoni* Hook. f. "A perennial species with creeping rootstocks, native to Mysore, India." (Piper.) 41889. *A. odoratus* Lisboa. "A species with odorous herbage and stems 3 to 4 feet high, thick as a goose quill. Native to Deccan, India." (Piper.) 41890. *A. pumilus* Roxb. "A slender species with stems 6 to 18 inches high; native in the drier parts of India." (Piper.) 41891. *A. purpureosericeus* Hochst. "An annual species with stems 3 to 4 feet high. Native to Abyssinia and India." (Piper.)

Apluda aristata Torner. (Poaceae.) 41892. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A perennial leafy grass, the tall stiff stems branched above. Readily eaten by cattle when young according to Duthie, but becoming rather woody." (C. V. Piper.)

Cariniana legalis (Mart.) Kuntze. (Lecythidaceae.) 41933. Seeds of Jequitiba from Brazil. Collected by Mr. H. M. Curran. "One of the largest of Bahian timber trees. Ornamental. Wood hard, light brown, and well known in markets." (Curran.)

Cenchrus biflorus Roxb. (Poaceae.) 41894. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A perennial grass native in southern Asia and Africa. It is abundant in northern India, where it is considered one of the most nutritious grasses and excellent both for grazing and for hay. In Florida and along the Gulf Coast it succeeds well and tends to spread naturally but the growth is sufficient only for grazing as on sandy soil the grass grows only 6 to 12 inches high." (Piper.)

Chionachne barbata (Roxb.) R. Brown. (Poaceae.) 41895. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A tall, coarse, branching grass native to the hot and damp parts of India. When mature the grass is very coarse, but when young is said to be used as fodder." (C. V. Piper.)

Chloris spp. (Poaceae.) 41896-41898. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. *Chloris gayana* Kunth. 41896. "A perennial grass, native to South Africa, first cultivated by Cecil Rhodes in South Africa about 1895. The grass is fine stemmed, very leafy, and grows to an average height of about 3 feet. The flowering head consists of 10 to 15 long, spreading spikes in a cluster, and seed is produced in abundance. The grass also spreads by means of running branches 2 to 6 feet long, which root and produce a plant at every node. Notwithstanding this method of reproduction, Rhodes grass has at no place in the United States become troublesome as a weed. Rhodes grass is completely destroyed when the temperature in winter falls to about 18°F., and as a perennial grass is therefore adapted only to southern Texas, Florida, and a narrow strip along the Gulf coast. Farther north it must be treated as an annual. At Washington, D. C., it will produce but a single crop of hay in a season. Farther south two cuttings may be obtained under favorable conditions. On fertile land in central and southern Florida, however, as many as six to seven cuttings are secured in a single season. A good stand of Rhodes grass will yield from a ton and a quarter to a ton and a

half of hay to a cutting. This hay is of very fine quality and is eagerly eaten by horses and cows. In Florida it is already being grown on a commercial scale." (C. V. Piper.) 41897. *Chloris paraguiensis* Steud. "A perennial grass native to India, Burma, and Ceylon, but now widespread in the tropics. According to Duthie it is considered in northern India 'a good fodder grass up to the time of flowering, after which time cattle will not touch it'. In Australia it is considered one of the best grasses for pasturage and hay. Previous tests in this country (No. 36255) did not indicate that it is of much value." (Piper.) 41898. *Chloris virgata* Swartz. "An annual grass forming stools 2 to 3 feet high. Originally described from the West Indies, but apparently the same species occurs in the tropics of the Old World. It has been tested at many places in the United States, but nowhere has it given sufficient promise to warrant cultivation." (Piper.)

Chrysopogon montanus Trin. (Poaceae.) 41899. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "This perennial grass is a handsome species growing to a height of 3 to 5 feet. In India it has an excellent reputation for fodder and according to Duthie the seeds are collected and used for food by the natives. This grass has succeeded well in Florida and at Biloxi, Miss., and in this region possesses some promise as a pasture grass." (C. V. Piper.)

Crataegus pinnatifida Bunge. (Malaceae.) 41952-41953. Hawthorn seeds from near Peking, China. Collected by Mr. D. F. Higgins. 41952. "*Sia-la-hung*. The large Chinese thorn-apple which is grafted on seedlings of the smaller variety. These seeds are not fertile." 41953. "*Sia-la-hung*. Chinese thorn-apple. These are the seeds of the wild indigenous variety. It is also cultivated for its fruit and for the stock on which the large variety is grafted. These seeds are fertile." (Higgins.)

Crataegus pinnatifida Bunge. (Malaceae.) 42017. Seeds of a hawthorn from Tamingfu, Chih-li, North China. Presented by Rev. Horace W. Houlding. "Named in Chinese *Shan Li Hung* or Mountain red pear. My wife says to her it stands next to the apple for home use in cooking. It is good for jelly and marmalade and when dipped whole into melted rock-sugar it makes the finest confection and one of the most healthful that I know of. There is a use for this fruit in America." (Houlding.)

Eragrostis abyssinica (Jacq.) Schrad. (Poaceae.) 41903. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "Teff, cultivated as a good grain in Abyssinia, has in recent years proven very valuable for

THE TANGSI CHERRY (*Prunus pseudocerasus* Lindl.), S. P. I. No. 18587.

This Chinese cherry, introduced by Mr. Frank N. Meyer from Tangsi, a small town in the Chekiang Province of China where orchards of it are grown, ripens its fruit a week to 10 days earlier than the commercial varieties now grown in northern California. In 1914 ripe fruit was picked from March 30 to April 3. Though a thin-skinned, medium-sized cherry, not larger than the Early Richmond, it is of excellent flavor and because of its extreme earliness will probably become a profitable commercial sort. The fact has recently been pointed out that this is doubtless the true *Prunus pseudocerasus* of Lindley, a name erroneously applied to the Japanese flowering cherry (*Prunus serrulata* Lindl.). The vigor of this Tangsi cherry has attracted the attention of the growers and suggests its use as a stock for other varieties. Natural size photograph (Chico 467), by Mr. R. L. Beagles, taken April 3, 1914, at Test Orchard, Chico, Cal.

Pl. 184.

PLANT OF GARBANZO (*Cicer arietinum*) GROWN AT SPOKANE, WASH., S. P. I. No. 26898.

Experiments with the garbanzo or chick-pea, which is ranked next to the wheat plant in importance by many Spanish farmers, have been made in various parts of the United States. In parts of California garbanzos have been successful, but their culture as far north as Spokane has not heretofore been reported. This plant was grown by Otto Hubenthal, proprietor of the Spokane Nursery, from seed of a Mexican type secured from a commercial house in New York. Altogether too little attention has been paid by Americans to the good qualities of this nutritious legume, which is deserving of a thorough investigation, particularly as a garden vegetable. Its pods contain each a single seed and these, either fresh, dried, parched, or ground into flour, are palatable and nutritious. Although the plants grow and bear sparingly in the moister regions of the United States, they are especially adapted to cultivation in the dry, hot regions, where they fruit abundantly. Photograph (P15661FS) made at the Office of Foreign Seed and Plant Introduction, March 8, 1915.

hay production in South Africa. In view of these results it is at present being tested again in various parts of the United States. Numerous previous trials have indicated that teff can not compete with heavier yielding annuals such as millet and Sudan grass as a hay crop, but in some parts of the United States it may yet prove to be valuable." (C.V. Piper.)

Escallonia langleyensis Veitch. (Escalloniaceae.) 41962. Cuttings from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. "An elegant, evergreen, or in hard winters, semi-evergreen shrub, becoming eventually 8 feet or more high, and producing long, slender, arching shoots in one season. Flowers of a charmingly bright rosy carmine, ½ inch across, produced during June and July (a few later) in short racemes of about half a dozen blossoms terminating short leafy twigs; calyx and flower-stalk slightly glandular. This very attractive shrub was raised in Messrs. Veitch's nursery at Langley about 1893 by crossing *E. philippiana* with *E. punctata*. Although not quite so hardy as the first of these, it is hardy enough to stand all but the severest of frosts, and even then will break up from the ground. It is distinct from other Escallonias in its slender arching branches, which bear the racemes on the upper side. The color of the flowers, too, is different from that of any other Escallonia except *E. edinensis*." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 528.)

Indigofera argentea L. (Fabaceae.) 41929. Seeds from Cairo, Egypt. Presented by Mr. Thomas W. Brown, Director, Horticultural Division, Ministry Agriculture, Giza Branch. "This species is the only one cultivated in Egypt." (Brown.) "The *Indigofera argentea* is a perennial plant, but in cultivation is either biennial or (generally) annual. It is of a woody nature, the dye being extracted from the leaves." (Foaden & Fletcher, Text-Book of Egyptian Agriculture, pp. 512-519.)

Indigofera trifoliata Torner. (Fabaceae.) 41909. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A perennial having copiously branched trailing or suberect stems one to two feet long, soon glabrescent. Found in the Himalayas ascending to 4,000 feet in Kumaon, to Ceylon and Tenasserim." (Adapted from Hooker, Flora of British India, vol. 2, p. 96.)

Iseilema wightii (Nees) Anderss. (Poaceae.) 41914. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A grass native to India occuring in low or swampy land. Stems one to three feet high. Duthie considers its fodder value probably equal to that of *Iseilema*

secure these scions were made by Mr. Frank N. Meyer, Agricultural Explorer of this Office, during his stay in Japan in September, 1915, and Mr. H. Suzuki, Manager of the Yokohama Nursery Company, very kindly superintended the collection and shipment of them to this country. Thanks are due to Mr. Post Wheeler, Charge d'Affaires of the American Embassy in Tokyo, for conducting the arrangements with the Tokyo authorities. Mr. Wilson collected flowering specimens from the Arakawa collection and these are now in the herbarium of the Arnold Arboretum and will be of assistance in checking up the varietal nomenclature, which is much complicated. The hardiness of these flowering cherries in many parts of the United States, the fact that they flower at the most bewitching time of the year,—April and May—and are peculiarly attractive for small gardens and yards, and that most of them are introduced for the first time into this country, make the presentation of this valuable collection by the Mayor of Tokyo and his associates a matter of very unusual interest to Americans. (Fairchild.)

Sesban aculeatum (Schreber) Poir. (Fabaceae.) 41916. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A tall, very rapid growing species reaching a height in one season of 12 to 20 feet in Florida and Mississippi, the stems woody and 2 to 4 inches in diameter. While this species is employed as a green manure crop in the tropics, its woody stems and great growth make it undesirable for agricultural use in America." (Piper.) Its masses of handsome yellow flowers however make it worthy of a trial in our summer flower borders where tall rank growing plants can be utilized. (Fairchild.)

Solanum quitoense Lamarck. (Solanaceae.) 42034. Seeds of *Naranjilla* from Quito, Ecuador. Presented by Mr. Ludovic Söderström, through Mr. Charles S. Hartman, American Minister. "The plant is about 6 to 8 feet high with hairy leaves and produces a fruit like a small orange; it is rather acid to taste. Each plant bears hundreds of flowers and fruits. The plant lasts 5 or 6 years after which a new plantation must be made. The best plantations are in the clearings at 5,000 to 6,000 feet altitude. The mean temperature is 17 to 19 degrees C. The fruit seems to be the principal article of food during certain seasons for the settlers in the woods. I have never found this plant flourish in the dry valleys in the interior but always in the clearings in the woods." (Söderström.)

Solanum sp. (Solanaceae.) 42026. Tubers from Tucumán, Argentina. Presented by Mr. E. F. Schultz, Horticulturist, Agricultural Experiment Station, through Mr. John S. Calvert, American Vice-Consul, Buenos Aires. "The Agricultur-

CHINESE WET-LAND GINGER.

A plantation of ginger (*Zinziber officinale*) on wet land, with taro along the edges of the beds and in empty spaces. The growers informed us that they realize from $16 to $18 (Mex.) per mau of land, which is roughly from $48 to $54 United States gold per acre. The work of ridging the beds is considerable, while during rainy weather the land is of a swampy nature and to labor in it may not appeal to farmers in western countries. Photograph (P13175FS) by Mr. Frank N. Meyer, near Paoki, Shensi, China, September 14, 1914.

A GROVE OF THE TAMOPAN PERSIMMON (*Diospyros kaki* L. f.), S. P. I. No. 16921.

W. P. Fulton standing beside one of the trees in his Tamopan persimmon grove at Brooksville, Fla. This is the largest grove of this new Chinese variety in America. It is on high hammock land in western Florida, and apparently the variety is admirably adapted to the conditions there. The trees have already borne fair crops of fruit of good quality. Photograph (P15924FS) by Mr. Peter Bisset, August 3, 1915.

al Department is carrying on certain breeding experiments with potatoes and these resistant wild strains may prove useful for this purpose. These tubers were gathered on very heavy clay soil, from a piece of land which is completely water-soaked during at least three months in a year and extremely dry for about seven or eight months in succession. The tubers possess, therefore, certain resistant properties which it may be found useful to impart to the cultivated varities in the States." (Schultz.)

Styrax hookeri C.B. Clarke. (Styracaceae.) 41815. Seeds from Darjeeling, India. Presented by Mr. G. H. Cave, Lloyd Botanic Gardens. "This is a small tree frequently met with in Sikkim and Bhutan at altitudes between 6,000 and 7,000 feet. The wood is white, close-grained, and moderately hard." (Watt's Dictionary of the Products of India.) Inasmuch as *Styrax japonica* ranks as one of the most beautiful of all flowering shrubs or small trees and is perfectly hardy in the Atlantic States and easy to grow from seed it is suggested that the getting together of all the species of this genus which bear attractive flowers and their hybridization might lead to practical results. (Fairchild.)

Thelepogon elegans Roth. (Poaceae.) 41918. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "A coarse perennial grass with stems one to three feet high, usually woody at base. When growing in rice fields it is difficult to distinguish until in flower. Cattle and horses eat the herbage when it is young and in some parts of Central Province the seeds are used as human food. Native to India and Africa." (C. V. Piper.)

Tricholaena rosea Nees. (Poaceae.) 41921. Seeds from Kirkee, India. Presented by Mr. William Burns, Economic Botanist. "When a single plant of Natal grass is allowed abundant room it will form a large tuft, sometimes 3 to 4 feet in diameter, the lower branches soon becoming decumbent, while the central stems are more nearly erect. The stems are slender, 3 to 4 feet high, and well covered with leaves, which are so nearly erect that few are lost in mowing the hay. The seeds are produced in large clusters of about the size and shape of a panicle of oats. In most cases the seed clusters are bright red or rosy crimson in color, and for that reason the grass has sometimes been called 'redtop'. It is, however, very different from the common northern grass known as redtop. The name 'Natal grass,' which indicates the country of which it is a native, is more appropriate and distinctive and is the one now in most common use. The plants are killed by a single plowing, and by keeping the land cultivated in other crops through the whole of a single season all the seeds in the

ground will have germinated and the young plants will be killed by the cultivation, so Natal grass can not become a troublesome weed." (C. V. Piper.)

Virola sp. (Myristicaceae.) 41945. Seeds from Brazil. Collected by Mr. H. M. Curran. "*Biquiba* or *Bicuhyba*. A common ornamental and timber tree of large size, with brown, medium hard wood, well known on the Brazilian market. The seed is said to yield an oil used in medicine, or for soap-making." (Curran.)

Vitis davidii Foex. (Vitaceae.) 41877. Seeds from Shanghai, China. Presented by Mrs. A. Anderson, through Mr. Frank N. Meyer. "A luxuriant, deciduous climber, the young shoots now downy, but covered with spiny, gland-tipped, somewhat hooked bristles, which give them a rough appearance. Leaves heart-shaped, slender-pointed, toothed; 4 to 10 inches long, $2\frac{1}{2}$ to 8 inches wide; shining dark green and smooth above, bluish or greyish green beneath, and downy only in the vein-axils, but more or less glandular-bristly, as is also the leaf-stalk, which is from half to nearly as long as the blade. Fruit not yet seen in this country, but said to be about 2/3 inch diameter, black, and of a pleasant flavor. Native of Central China; introduced by Wilson for Messrs. Veitch in 1900, but if, as I believe, the vine called *Spinovitis davidii* is the same, it has been cultivated in France and in England since about 1885. The plant cultivated at Kew under the latter name has leaves more deeply lobed and more coarsely toothed than Wilson's *V. armata*, and the spines are smaller; but in other respects it does not appear to differ. According to Carriére, the leaves are very variable in shape." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, Vol. 2, p. 667, under *V. armata*.)

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant in charge of Chayote Investigations.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. William S. Lyon, Manila, Philippine Islands.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF DIVISION OF FORESTRY COLLEGE OF AGRICULTURE UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 119. MARCH 1916.

Genera Represented in this Number.

	Page		Page
Arracacia	972	Inodes	976
Bambos	972	Ligustrum	976
Baryxylum	973	Mangifera	980-982
Berberis	973	Nephelium	977
Cannabis	973	Paulownia	977
Capsicum	974	Phaseolus	977
Cassia	974	Pittosporum	978
Cercidiphyllum	974	Prunus	978
Chilopsis	975	Puya	978
Cornus	975	Ribes	979
Cymbopetalum	975	Soja	979
Dasylirion	975	Spiraea	979
Hydrangea	976	Viburnum	979
Indigofera	976		

Plates:

Pl. 187. The Basket Willow of Madeira, Salix viminalis.
188. Tung-Oil Tree, Aleurites fordii.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested .

Permission to publish on application only.

Arracacia xanthorrhiza Bancroft. (Apiaceae.) 42137. *Apio* tubers received from Kingston, Jamaica. Presented by Mr. William Harris, Superintendent Hope Gardens. "This uncommon vegetable is a native of the Andes in South America where it is cultivated between 5,000 and 7,000 feet altitude. It is a low parsnip-like plant, producing large edible starchy, carrot-shaped roots, the flavor of which has been compared to a combination of parsnip and potato. The plant will thrive in any good soil, and is adapted only to the higher elevations, say from 4,500 to 6,000 feet. It is commonly cultivated as a vegetable at Bogota in Colombia up to 8,000 feet elevation." (H. F. Macmillan, Handbook of Tropical Gardening, 2nd Edition, p. 234, 1914.) Requires 12 to 16 months without frost for development of its fleshy roots. See Plant Immigrants No. 75 for Plate and description p. 548.

Bambos guadua Humb. & Bonpl. (Poaceae.) 42066. Seeds from Puerto Bertoni, Paraguay. Presented by Dr. Moises S. Bertoni. "In connection with Guaduas I must notice the guadua itself, the most indispensable plant of all New Granada after the plantain, the cane and maize. It might be called the lumber-tree, for it supplies all our fencing except walls of brick, rammed earth, and rarely of stone, and also the wood-work of most houses and whatever is made of boards at the North. It is an enormous grass, like the bamboo of the Eastern tropics, growing, however, to a less height, only 30 or 40 feet. The slender foliage is of inconceivable beauty, comparing with that of other trees as ostrich feathers do with goose-quills. The stem is about 6 inches in diameter with joints about 20 inches apart. The thickness of the wood is nearly an inch. When poles or slats are wanted, the stem is split into four, six or eight parts. For boards for the top of a coarse table, bench, or bedstead, it is opened and flattened out, splitting almost at every inch of width, but not coming entirely apart. For a dish, candle-case, grease-pot, or extemporaneous vessel for carrying drink to a company of hunters or laborers, it is cut off just below the partitions. Such a receptacle is called a tarro. Tarros of double capacity are made for bringing the domestic supply of water for a family, by taking a piece two joints long, with a septum at each end and one in the middle. A hole is made in the upper and middle septa, and if they be used for carrying molasses, a bung can be put in, or an orange used for a stopper. Bottles of a single joint are used for holding castor oil, ect. In short, the uses of the guadua are innumerable. The guadua starts from the ground with the full diameter, or nearly so, but the joints are at first very short. Some

trees send out branches, and they are long, straggling, and terribly thorny. Others grow with a diameter of only two inches, and make good poles for bringing down oranges, every one of which has to be torn from the tree, or it decays without falling. The cavities of the guadua often contain water. It is erroneously believed that the quantity increases and diminishes with the phases of the moon. Stones are said also to be found in these joints. This might be expected, but I never found an authentic instance, and doubt the fact. The only instance believed to occur under my own observation was certainly false, as the stone was an ordinary one. I must state one other thing about the guadua which is unusual in the vegetable kingdom here, but very common at the North. It is apt to take entire possession of the ground on which it grows. Now a square mile covered with the same species, say a pine, an oak, or the beech, an acre covered with the same species of grass or whortleberry or other plant, is no uncommon thing at the North, but in the tropics it is quite different. Plants are not gregarious here, still less exclusive. I have seen the guava grow in natural orchards where most of the trees in a considerable space were Psidium, but even this is rare, and in general you cannot expect, where you have found a plant you want, to find others of the same species near it. If I wish to find a second lime-tree, for instance, it is of no more use to look in the neighborhood where I found the first than in any other. But a guadual is a considerable space, almost always near a stream, where scarce the smallest intruding plant is permitted. The guadua might be cultivated to great profit, but I never knew of but one attempt at it. The flower and seeds are so rare that few botanists have ever seen them." (Holton, New Granada, pp. 109-110.)

Baryxylum dubium (Spreng.) Pierre. (Caesalpiniaceae.) 42325. Seeds from Buenos Aires, Argentina. Presented by Sr. Benito J. Carrasco, Director, Botanic Gardens. A handsome ornamental tree with mimosa-like foliage and striking yellow flowers arranged in huge panicles. It is closely related to the Royal Poinciana and vies with it in beauty of flower and foliage.

Berberis hookeri viridis Schneider. (Berberidaceae.) 42185. Seeds from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. Described as a useful evergreen barberry.

Cannabis sativa L. (Moraceae.) 42166. Seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. "*Tochigi* (pronounced to-ching-ee) hemp is regarded as the best fiber producing hemp in Japan. It is cultivated most

extensively in the province of Tochigi, about 100 miles north of Yokohama. The slender tall stalks produce a fiber somewhat finer than the average Kentucky hemp. Although this is one of the most promising strains of foreign hemps it is not likely to give satisfactory results in this country until after it has been acclimated by cultivation and selection two or three generations." (L. H. Dewey.)

Capsicum annuum L. (Solanaceae.) 42070-42071. Seeds of two varieties of Chile pepper from State College, New Mexico. Presented by Mr. Fabian Garcia, New Mexico College of Agriculture and Mechanic Arts. These were procured on account of their being very prolific and early strains.

Capsicum annuum L. (Solanaceae.) 42074. Seeds of red pepper from Barcelona, Spain. Presented by Mr. Carl Bailey Hurst, American Consul General. "Spanish sweet pepper known to Spanish agriculture and industry as *Pimiento dulce morron*." (Hurst.)

Cassia siamea Lam. (Caesalpiniaceae.) 42362. Seeds of Madagascar. Presented by Mr. Eugene Jaeglé, Director, Agricultural Station of Ivoloina near Tamatave, through Mr. James G. Carter, American Consul. A valuable, medium-sized shade tree, having pinnately compound leaves and oblong, medium sized leaflets. It is decidedly ornamental on account of its erect, terminal panicles of yellow flowers and elongated flat pods. It is commonly cultivated in the Philippines and has done remarkably well in Cuba. The wood is considered of value for house columns and in the making of furniture. (Adapted from De Lanessan, Plantes Utiles Des Colonies Francaises, and Catalogue of Manila City Nursery.)

Cercidiphyllum japonicum Sieb. & Zucc. (Trochodendraceae.) 42067. A hardy ornamental shrubby tree of pyramidal and when young, almost fastigiate habit, with handsome light green foliage, purplish when unfolding, turning bright yellow or partially scarlet in fall. It prefers rich and moist soil, and grows rapidly when young. A recently introduced Chinese variety, var. *sinense* Rehd. & Wilson, is perhaps still more desirable than the type. It is the largest of all broad-leaved trees known from China, the trunk is sometimes free of branches for nearly 50 feet above the ground, and attains to 25 feet or exceptionally to 55 feet in girth. (Adapted from Bailey, Standard Cyclopedia.) This gorgeous tree introduced from Japan by Col. Clarke who went to Sapporo for the Japanese Department of Agriculture deserves to be much more widely planted than it is. Its pink leaves are beautiful in Spring and in Autumn turn a wonderful yellow color. The trunk should be protected from the sun as much as possible. Likes moist ground. Perfectly hardy in the Arnold Arboretum at Boston.

Chilopsis linearis (Cav.) Sweet. (Bignoniaceae.) 42202. Seeds from the Santa Rita Mountains, Arizona. Collected by Dr. David Griffiths. "This is a willow-like small tree inhabiting desert washes from Texas to California. It is very showy when in blossom, the flowers being purplish tinged and resembling those of a miniature catalpa. In nature its habit is quite open and lax, but it stands pruning and can easily be shaped as desired. The seed can probably be planted in the open in a situation where there is good drainage and where moisture conditions can be controlled when the hot, dry season arrives." (Griffiths.)

Cornus bretschneideri Henry. (Cornaceae.) 42188. Seeds from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. A Chinese Cornus, with the young wood blood red, which succeeds well as far north as Rochester, New York. The flowers in dense cymes and fruit black.

Cymbopetalum penduliflorum (Dun.) Baillon. (Annonaceae.) 42047. Seeds from Guatemala. Presented by Mr. Stuart K. Lupton, American Consul, Guatemala City. "Sacred ear flower, or *orejuela*, as it is locally known. These petals and seeds were obtained through the kindness of Mr. R. S. Anderson, an American resident in Coban, Guatemala." (Lupton.) See article by Mr. W. E. Safford on this plant, Smithsonian Report 1910, p. 427-431.

Dasylirion wheeleri S. Wats. (Liliaceae.) 42203. Sotol seed collected by Dr. David Griffiths. "The sotol is on the whole a rather stiff, formal plant of the yucca family. It has a short, thick trunk, long, narrow, flat, spiny-edged, gracefully-drooping leaves, very different in this respect from the stiff, rigid century plants which are not distant relatives. It does not sucker like the century plants, neither does the plant die when it has thrown up a flower stalk, thus leaving an ugly break in the planting. Its flower stalks are immense. They often reach a height of 8 or 10 feet, the myriads of small flowers occupying a solid, spindle-shaped space 4 feet in length. The plant itself, with its glaucous graceful leaves, is handsome, but it is strikingly attractive from early blossoming until late winter after the mass of seed has fallen. They are most attractive as specimen plants. In Mexico the leaves are stripped of their curved teeth by being pulled through a slit cut in a piece of tin and then woven into a durable floor covering, the ones which I have seen lasting in good condition for a couple of years under ordinary wear. The usual practice is for the weaver to enter the house with an armful of the leaves suitably stained, begin in one corner of the room and weave a mat to fit the floor, composing the design as he proceeds. The price is usually

about forty cents (Mexican money) per meter. From the stems of the plant, particularly in the state of Chihuahua, is manufactured one of the most violent intoxicating distillates. In times of excessive drought the plants are cut down and the stems chopped up as feed for live stock. I believe that the seeds of this planted where drainage is good and where moisture conditions can be controlled can be brought through in the open." (Griffiths.)

Hydrangea xanthoneura wilsonii Rehder. (Hydrangeaceae.) 42190. Seeds from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. A tree 15 to 16 feet hign of elegant and distinct habit, with clusters of white flowers 10 to 12 inches across. Discovered by E. H. Wilson in Western Szechuan, China.

Indigofera spp. (Fabaceae.) 42173-42176. Seeds of four species of indigo from Buitenzorg, Java. Presented by Director, Department of Agriculture, and introduced for experiments by this Department in dye production.

Inodes texana O.F.Cook. (Phoenicaceae.) 42280. Seeds collected by Dr. David Griffiths. "This native palm of the Rio Grande delta, while planted locally to some extent, is a species which has been much neglected. It will fill the same role in plantings as the fan leaf palm (*Washingtonia sp.*) and appears to be a little more hardy to frost conditions. It will form a pleasing variation with that species so extensively grown in the warmer regions of this country and serve to extend somewhat the regions of possible palm culture. It is a species with a very local distribution in nature being known only from this one delta region. It is reproducing well in the natural state at present. The seed germinate readily soon after they fall from the trees in late autumn. It is however, extensively gathered and made into ornaments by the native population. This no doubt interferes decidedly with its reproduction." (Griffiths.)

Ligustrum spp. (Oleaceae.) 42211-42222. Cuttings of 12 hybrid privets from New Haven, Connecticut. Presented by the Elm City Nursery Company. "The seed parent was *Ligustrum ovalifolium*, pollen parent *Ligustrum ibota* (northern type). Seed obtained from *Ligustrum ovalifolium* in the fall of 1910 from single plant in a group of several of *Ibota*. The seed plant attracted our attention as it hung heavy with fruit which is not common in this vicinity. The inference was that cross-fertilization had taken place with *Ibota*. The seedlings some hundreds of which were planted into the field the following season showed every indication that the crossing did take place. No two are very similar, varying greatly from upright to almost prostrate

THE BASKET WILLOW OF MADEIRA AS A SNOW FENCE ON LONG ISLAND.

A row of willows grown from cuttings of S. P. I. No. 19856, *Salix viminalis*, at the Experimental Farm of the Long Island Railroad at Medford, N. Y. Rows like this were planted along the line of the Long Island Railroad by Mr. H. B. Fullerton, and because of the fact that this species of willow grows just the right height and forms a dense mat of branches, it has proven to be an excellent snow fence. According to Mr. Fullerton, the railroad is now planting considerable stretches of its road with this willow, depending upon it to prevent the snow from drifting into the cuts. It takes the place of the board snow fences. This willow, which was secured by Mr. Fairchild in Funchal, is grown extensively in the island of Madeira, and many kinds of furniture are made from it and shipped all over the world. It forms one of the important industries of the island. Photograph by Mr. H. B. Fullerton, Medford, N. Y.

TUNG-OIL TREE (*Aleurites fordii* Hemsley), S. P. I. No. 21013.

A very prolific but small-fruited tung-oil tree growing at the Agricultural Experiment Station, Experiment, Ga. This tree when planted out in 1908 was 1 year old from seed, and when 7 years old, in 1914, it produced over 2½ bushels of fruit, containing 45½ pounds of clean seeds. These seeds were given S. P. I. No. 39532. Photograph (P15755FS) by Mr. R. A. Young, September 28, 1914, showing Mr. H. P. Stucky standing beside the tree.

in habit, some very luxuriant and others quite dwarf, some now producing terminal clusters of fruit while others fruit on the lateral branches only. Many have glossy leaves which are quite as persistent as *ovalifolium*, the foliage of others matures early. From among the original planting we have now reduced the number which have unquestioned merit to 50 and these are growing at Edgewood. They vary at present in height from two feet to twelve. We anticipate that some of them will prove to be valuable hedge plants partaking enough of the characteristics of *ovalifolium* to give these plants desirable hedge qualities and at the same time prove more hardy owing to the infusion of *Ibota* blood. They have not yet been subjected to temperature exposures which have killed *ovalifolium* entirely to the ground, conditions which do occur occasionally in this vicinity so their relative hardiness has not yet been absolutely determined as yet." (Elm City Nursery Co.)

Nephelium lappaceum L. (Sapindaceae.) 42086. One seed from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director Botanic Garden. "*Ramboetan atjeh matjan*. A tree up to 25 meters high. This fruiting tree is an ornament of the Javanese village groves, because the pretty, often more or less dense leaf-crown is decorated on the outside with the numerous scarlet, long-stemmed fruits the size of a hen's egg. Arillus white, very juicy, more or less sour." (Koorders and Valeton, Systematisches verzeichnis.) See Plant Immigrant No. 31, for photographs and previous description.

Paulownia mikado Ito. (Scrophulariaceae.) 42036. Seeds from Taihoku, Formosa, Japan. Presented by Mr. M. Takata, Department of Productive Industries. A magnificent tree 30 to 50 feet high, much resembling the well known *P. imperialis*, but having slightly shorter panicles of larger lilac or purple-tinted flowers dotted with purple on the inside of the corolla. A native of Central Formosa. (Adapted from T. Ito, Icones Plantarum Japonicarum, Vol. 1, p. 5, pl. 9, 1912.)

Phaseolus lunatus L. (Fabaceae.) 42270. Seeds of Lima bean from Tamatave, Madagascar. Presented by Mr. James G. Carter, American Consul. "Commonly known in Madagascar as 'pois du cap' (Cape beans). The annual quantity of Cape beans exported from the west coast of Madagascar amounts to about 7,000 tons. These go principally to England, and, from there, are exported in considerable quantities to the New York market." (Carter.)

Phaseolus vulgaris L. (Fabaceae.) 42049. Seeds from Puerto Bertoni, Paraguay. Presented by Dr. Moises S. Bertoni. "Forma *tawana*. The *taguana*, or giant bean of the Guar-

anis, which is only a form of the common bean, perhaps the typical form from which the beans arose. But if it is botanically only a form, from the agricultural point of view it is more than a variety. This bean has been cultivated by the Guaranis certainly since a remote antiquity. The most notable peculiarity of this variety is its enormous growth. It has a long shoot which grows to 15 or 20 meters so that in a wood it climbs to the tops of high trees. Cultivated without branching it develops less, but yet produces abundantly, the production keeping step with the development, so that a well developed plant will produce up to 10 kilos of clean seed." (Bertoni, Agronomía, vol. 5, p. 326-327, 1913.)

Pittosporum fairchildi Cheeseman. (Pittosporaceae.) 42177. Seeds from Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery. "This variety bears a striking resemblance to *P. crassifolium* (S.P.I. No. 41290), but is the more dense of the two, consequently better. It ripens its seed several months later; makes a splendid hedge and good also as a shrub tree, height about 20 feet. This variety was discovered by the late Captain Fairchild, on an island off the New Zealand coast. The seeds take a long time to germinate, and forcing them is of no use. Plants are tender when young but hardy when established." (Wright.)

Prunus bokhariensis Royle. (Amygdalaceae.) 42057. Seeds from Simla, Punjab, India. Presented by Mr. E. Long, Superintendent, Vice-Regal Gardens. The Alucha, Aru Bokhara or Annandale plum. Somewhat resembles *Prunus triflora*, but is believed to be a distinct species, and appears to be of much value in breeding work.

Puya chilensis Molina. (Bromeliaceae.) 42082. Seeds from Lima, Peru. Presented by Dr. A. Weberbauer. "One of the most interesting plants of the Peruvian Cordilleras. I collected the seed at Capaya, Department of Apurimac, Province of Aymaraes, at an elevation of 4,000 to 4,100 meters above sea level, in a region where frosts and snowfall are abundant. The plants need not therefore perhaps be cultivated in a greenhouse, but require only protection against sharp frosts and must naturally receive much light. In the vicinity of Capaya the plant is called *titanca*. Heretofore I have known this plant only from the Cordilleras between 9 and 10° S. and have described and figured it in my book, Die Pflanzenwelt der Peruanischen Anden." (Weberbauer.) "This is one of the most striking of our Bromeliaceous plants, cultivated in a cool stove of the Royal Gardens of Kew. The stem, or caudex, has now attained a height of four feet, independent of the leaves, which are from three to four feet in length, spreading in all direc-

tions; the lower ones being reflexed. These leaves would render the plant admirably suited to the formation of fences, in the nature of the spinous margins; for the upper half of the leaf has all the spines directed forward towards the apex, presenting a great obstacle to intrusion of man or beast in that direction, whilst those lower down the leaf (longer and stronger too) have their curvature downwards, so that if man or animal is so bold as to make his way partially through, the decurved spines would prevent his retracing his steps with impunity. The compound spike of flowers upon the column-like perfectly straight peduncle is remarkable for its size; the large full yellow (but inclining to green) flowers and the copious bracteas turning brown or black in age. This plant is called *Cardon* and *Puya* in Chili, where the soft substance of the stem is used for corks and bungs: the flowers yield a remedy for hernia, and the Indians use the spines of the leaves for fish-hooks." (Curtis's Botanical Magazine, vol. 9, pl. 4715.)

Ribes spp. (Grossulariaceae.) 42223-42267. Cuttings of 45 varieties of black, red, and white currants from Lethbridge, Alberta, Canada. Presented by Mr. W. H. Fairfield, Superintendent, Experimental Station for Southern Alberta. Introduced for experimental work of the Office of Horticultural and Pomological Investiations because of their success in the trying climate of Alberta and for distribution through the North West.

Soja max (L.) Piper. (Fabaceae.) 42059. Seeds of soybean from Keijo, Chosen, Japan. Presented by Miss Katherine Wambold. "*Kong*. Cooked, pressed, hung all winter to rafters, then soaked in a brown liquid, called *chang*, used as a salty sauce on food. It is parched and eaten just so. A few partly cooked grains are often scattered in the rice as we use raisins in a rice pudding." (Wambold.)

Spiraea veitchi Hemsley. (Rosaceae.) 42195. Seeds from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. Considered by Mr. Wilson the best of Chinese Spiraeas. Produces arching shoots sometimes 6 feet long wreathed from end to end with clusters of pure white blossoms. Hardy in the Arnold Arboretum.

Viburnum rhytidophyllum Hemsley. (Caprifoliaceae.) 42199. Seeds from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. A remarkable shrub which is one of the most distinct and striking of all the newer Chinese shrubs. This shrub has a curious habit of forming its inflorescences and partially developing them in autumn, but they remain exposed all through the winter and until the blossoms expand the following May or June. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 655.)

NOTES ON BEHAVIOR OF PREVIOUS INTRODUCTIONS.

Among the numerous varieties of mangos introduced by this Office from the Orient and other regions, several are proving of great promise in south Florida, and at least one has been planted on a commercial scale. This is the Bennett, introduced from Bombay, India, under S.P.I. numbers 8419 and 8727. Under the first number, cions obtained from the Cooper estate were sent in by Messrs. Lathrop and Fairchild; under the second number cions were sent in by Douglas Bennett, for many years superintendent of the Bombay market, and for whom the variety has been named. The behavior of these two numbers in Florida has led horticulturists to believe that they are not precisely the same variety, since there are slight differences in the fruit. They are sufficiently alike, however, so that they cannot be distinguished by the average person. This mango, which was originally called Douglas Bennett's Golden Alphonse, but is now termed Bennett for convenience, is a selected form of the famous Alphonse mango of Bombay, noted for its unusual keeping qualities and excellent commercial characteristics. In Florida it has proved to be a more regular bearer than Mulgoba, yet does not usually produce heavy crops. The fruits are of excellent quality, the flesh being deep orange in color, free from fiber, and of a rich, luscious flavor. The only defect which has been pointed out by Florida growers is the rather dull color of the fruit, which makes it less attractive in the market than Mulgoba. Last season many crates of fruit were sent from one grove near Miami to the markets of the north, excellent prices being realized.

Paheri, while not yet planted commercially, seems likely to take an important place among the commercial mangos of the future. This variety, which was introduced from Bombay, India, under S.P.I. No. 8730, and was given to Messrs. Lathrop and Fairchild by Mr. T. N. Tata, the Parsee millionaire of Bombay is somewhat similar to Bennett in general characteristics, but has a reddish cheek, and is perhaps even richer in flavor. It gives promise of being a good bearer, showing a tendency to produce heavier crops than Bennett or Mulgoba. The fruit is considered in India to possess rather poor keeping qualities, and hence is not so valuable commercially as Bennett. It seems likely to be a sufficiently good keeper for market purposes in this country, however, since trial shipments which have been sent from Florida to Washington and held in cold storage have ripened and developed their characteristic aroma and flavor.

Amini, introduced from Bangalore, India, under S.P.I. No. 7104. through Dr. A. Lehmann, has proved to be one of the most attractive mangos grown in Florida. Its small size may be somewhat against it as a market fruit, but its unusually bright color,—deep yellow with a scarlet cheek,—makes it strikingly attractive, while its strong, spicy aroma is not equalled by that of any other variety grown in Florida. In flavor it is very spicy and aromatic, and the flesh is free from fiber. Its bearing habits have not been thoroughly determined as yet, but it seems likely to prove moderately productive, and worthy of general planting.

The Cambodiana race of seedling mangos which has been disseminated in south, Florida arose from two shipments of seeds, S.P.I. No. 8701, secured by Lathrop and Fairchild in Saigon in 1902, and 11645, secured through the late Director Haffner of the Botanic Gardens there. This is a race which comes practically true from seed, and the fruit is of very good quality. A seedling in the Plant Introduction Garden at Miami, S.P.I. No. 11645, has proved to be unusually prolific and regular in fruiting, and has recently been propagated by budding. This race, which is in many ways quite distinct from all of the Indian mangos, has shown itself more productive than any of the Indian mangos yet fruited in Florida, and seems likely to take a prominent place in the future.

D'Or, S.P.I. No. 28085, introduced by Mr. F. Evans, of the Botanic Department of Trinidad, is a West Indian variety which has proved of value. While the fruit is not so richly flavored as the best Indian varieties, it is of good quality, and the tree has the valuable habit of commencing to bear when very small, and producing heavily. Plants growing in 8-inch pots have fruited at the Miami Plant Introduction Garden. This variety is now being propagated commercially by nurserymen.

Gola Alphonse, S.P.I. No. 29506, purchased from Mr. Wm. Burns, of Poona, India, came into bearing at the Miami Plant Introduction Garden last season, and proved to be a very late variety. The fruit had remarkable keeping qualities, but is not very attractive in color. Inasmuch as late mangos are at present very scarce, this variety may become of considerable value. In quality it seems about equal to Bennett.

Sandersha, S.P.I. No. 7108, secured through Dr. A. Lehmann, of Bangalore, India, has become one of the best known Indian varieties in Florida, and has also been propagated rather extensively in Cuba and the Isle of Pines. It has no superior among the Indian varieties in productiveness and regularity of bearing, but is not looked upon

as a desirable dessert fruit, its flavor being subacid, and lacking in richness. The fruits are very large, often weighing two pounds, and ripen late in the season. For culinary use they are excellent, yielding delicious sauces, if stewed before fully ripe. Shipments to northern markets in past years have brought excellent returns, the fruits being marketable in October, when there are no other mangos available.

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
B. T. Galloway, Plant Pathologist.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathon Menderson, Assistant, in charge of Chayote Investigations.
David A. Bisset, Assistant in Plant Introduction.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Dr. Gustav Eisen, California Acadmey of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

Descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the Inventory of Plants Imported.

No. 120. APRIL 1916.

Genera Represented in this Number.

	Page		Page
Cacara	984	Malus	986
Careya	984	Mesembryanthemum	986
Cassia	984	Nephelium	986
Chusquea	984	Osterdamia	987
Cicer	984	Persea	989
Citharexylum	984	Prinsepia	987
Citrus	984	Prunus	987
Colocasia	985	Sasa	988
Cytisus	985	Spiraea	988
Eugenia	985	Strychnos	988
Hakea	985	Tamarix	988
Hibiscus	986	Uvaria	988
Inodes	986	Vitis	989
Macadamia	986	Zea	989

Plates:

Pl. 189. Fresh Fruits of the Litchi, Litchi chinensis.
190. The Oldest Litchi in Hawaii.
191. A Cherimoya Sugar Apple Hybrid, Annona cherimola.
192. Prunus Glandulosa.

Applications for material listed in these multigraphed sheets may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual List of New Plant Introductions.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

Permission to publish on application only.

Cacara erosa (L.) Kuntze. (Fabaceae.) 42567. Seeds from Shanghang, China. Presented by Mr. F. J. Wiens. "The root is edible and has a sweet delicious taste. The seeds are planted or sown in April or May and the flowers are all cut down except those wanted for seeds. The natives tell me the seeds are very poisonous." (Wiens.)

Careya australis (Benth.) F. Mueller. (Lecythidaceae.) 42464. Seeds from Brisbane, Australia. Presented by Mr. J. F. Bailey, Director Botanic Gardens. A large myrtaceous tree with alternate undotted leaves, large red flowers and globular, fleshy, edible fruit with a hard rind. The bark is made into twine and the wood, which is a light grey color, red in the center, close in grain and tough, is easily worked. (Adapted from Bailey, Queensland Flora, p. 667, 1900.)

Cassia angustifolia Vahl. (Caesalpiniaceae.) 42429. Seeds from Khartoum, Sudan, India. Presented by Mr. R. Hewison, Assistant Director of Agriculture. A small shrub, native of Arabia and East Africa and largely cultivated in parts of South India. It furnishes Tinnivelly Senna, the best known variety of this medicinal product. (Adapted from H. F. MacMillan, Handbook of Tropical Gardening and Planting, Ed. 2, p. 536, 1914.)

Chusquea culeou E. Desvaux. (Poaceae.) 42388. Seeds from Bariloche, Argentina. Presented by Dr. Joseph Vereertbrugghen. "*Canea*, the bamboo from this Cordillera. It is difficult to get ripe seed but at last I believe I have the real stuff, full grown, ripe and well dried. According to an agricultural paper of Buenos Aires, they have never tried to get this Bamboo from seed but transplanted the roots." (Vereertbrugghen.)

Cicer arietinum L. (Fabaceae.) 42454, 42456-42462. Seeds of chickpeas from Spain. 42454 presented by Mr. Thomas R. Geary, American Vice-Consul at Malaga; 42456-42458, by Mr. Paul H. Foster, American Consul at Jerez de la Frontera; and 42459-42462, by Mr. Robertson Honey, American Consul at Madrid.

Cicer arietinum L. (Fabaceae.) 42530-42531. Chickpea seed from Cairo, Egypt. Presented by Mr. Thomas W. Brown, Director, Horticultural Division, Giza Branch, Ministry of Agriculture.

Citharexylum barbinerve Cham. (Verbenaceae.) 42533. Seeds from Buenos Aires, Argentina. Presented by Sr. Benito J. Carrasco, Director Botanic Gardens. "Magnificent ornamental tree, with fragrant flowers, red fruits, flexible vibrant wood, used in the manufacture of guitars, from the cool and subtropical regions of Argentina." (Carrasco.)

Citrus limonia Osbeck. (Rutaceae.) 42606. Seeds from

Ch'ung-ch'ing, China. Presented by Mr. E. Widler. "This lemon answers almost the description of the Ichang lemon, excepting that its seeds are much smaller, and the inside seems to be all pith. These Szechwan lemons grow about 100 miles distant from Ch'ung-ch'ing. Chinese name, *Hsiang yuan*." (Widler.)

Colocasia esculenta (L.) Schott. (Araceae.) 42450. Taro tubers from Glenwood, Hawaii. Presented by Mr. J. B. Thompson, Superintendent, Glenwood Sub-station. "*Kuoho*. An upland taro. This variety was grown quite commonly around Hilo at the time of my visit to Hawaii in 1913, and was considered to be one of the best. The corms and tubers are very acrid in the raw state and require longer cooking to destroy the acridity than is necessary to cook them to a soft, mealy condition. The quality is good when the taro is thoroughly cooked." (R. A. Young.)

Cytisus dallimorei Rolfe. (Fabaceae.) 42552. Cuttings from Kew, England. Presented by Sir David Prain, Director, Royal Botanic Gardens. "A hybrid raised at Kew in 1900 by crossing *C. scoparius* var. *Andreanus* (seed bearer) with *C. albus*. It is a tall shrub, perhaps 8 or 9 feet high, of thin, erect habit, suggesting that of *C. scoparius*. Leaves mostly trifoliate, downy, young wood ribbed. Flowers about $\frac{5}{8}$ inch long, the whole of the petals suffused with beautiful shades of rosy pink deepening on the wing-petals to crimson; the almost orbicular standard petal is $\frac{5}{8}$ inch long, darker outside than within, keel almost white. Calyx helmet-shaped, shining brown, slightly downy, $\frac{1}{8}$ inch long; flower-stalk $\frac{1}{4}$ inch long, downy. At each node the flowers are solitary or in pairs. This beautiful broom is quite distinct from any other in cultivation, and is the first hybrid broom raised by artificial cross-fertilisation, all its predecessors having originated as chance crosses made by insects. It is propagated by grafting on Laburnum. As it flowers regularly and in great profusion in May, it ought in time to become a popular garden shrub. (W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 458.)

Eugenia pungens Berg. (Myrtaceae.) 42536. Seeds from Buenos Aires, Argentina. Presented by Sr. Benito J. Carrasco, Director Botanic Gardens. "*Guabiyu*. An ornamental fruit tree, from the temperate and hot regions of Argentina." (Carrasco.)

Hakea spp. (Proteaceae.) 42600-42604. Seeds from Ventimiglia, Italy. Received through the Superintendent, La Mortola Garden. 42600, *H. cucullata* R. Brown., 42601, *H. elliptica* R. Br., 42602, *H. laurina* R. Br., 42603, *H. suaveolens* R. Br., 42604, *H. varia* R. Br. "Drought-resistant plants which endure moderate frost and are therefore well adapted to the

drier parts of the South and Southwest. In California they are grown as far north as Sacramento. One of these, *H. laurina*, produces strikingly handsome flowers; *H. elliptica* is prized for the bronze color of its young foliage; while the spiny-leaved species are serviceable for planting in public parks or in any place where it is necessary for shrubs to protect themselves from pedestrians or vandals. (Bailey's Standard Cyclopedia of Horticulture, vol. 3, pp. 1427-1428.)

Hibiscus sabdariffa L. (Malvaceae.) 42471-42475. Seeds of five varieties of roselle from Manila, Philippine Islands. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture.

Inodes neglecta (Beccari) Cook. (Phoenicaceae.) 42522. Seeds from Azua, Santo Domingo. Received through Dr. J. N. Rose, U. S. National Museum. "A tree about 20 feet high, with large, fan-like leaves and large, more or less drooping flower clusters. It doubtless would prove a valuable palm for introdction in to the warmer parts of this country." (Rose.)

Macadamia minor F. M. Bailey. (Proteaceae.) 42468. Seeds from Brisbane, Queensland, Australia. Presented by Mr. J. F. Bailey, Director Botanic Gardens. A large shrub or small tree with slender branches, three-parted leaves, often crowded at the ends of the branches, and edible nuts about $\frac{7}{8}$ inch long and $\frac{3}{4}$ inch in diameter. A native of Queensland. (See F. M. Bailey, Queensland Agricultural Journal, vol. 25, p. 11, 1910.)

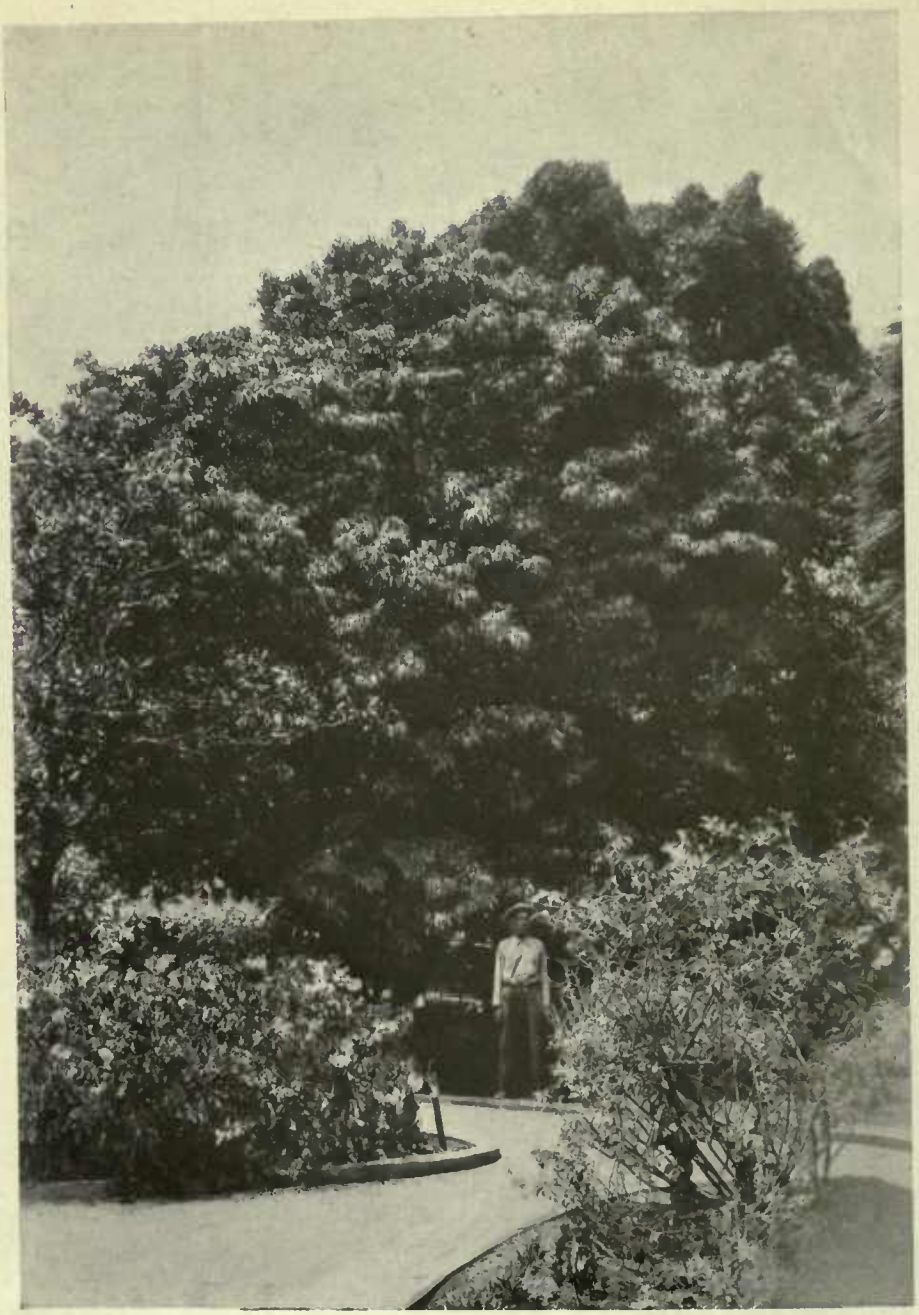
Malus pumila Miller. (Malaceae.) 42638. Seeds of Paradise apple from Christiania, Norway. Presented by Mr. Rolf Nordhagen, Botanic Garden. "A bushy apple growing apparently rarely over 5 feet in height. A native of the Caucasus, from whence it probably was introduced into Western Europe, where it is now so extensively used as a dwarfing stock for apples. This shrubby apple produces red apples of fair quality, is very drought resistant and stands high summer temperatures. May be used in hybridisation work, and in creating a strain of bush-apples." (F. N. Meyer.)

Mesembryanthemum spp. (Aizoaceae.) 42444-42448. Plants from San Francisco, Calif. Presented by Mr. John McLaren, Golden Gate Park. 42444, *M. aequilaterale* Haworth, Fig-marigold. 42445, *M. bicolorum* L. 42446, *M. floribundum* Haworth, Ice-plant. 42447, *M. pugioniforme* L. 42448, *M. spectabile* Haw.

Nephelium spp. (Sapindaceae.) 42384-41385. Seeds of *N. lappaceum* L. (*Rambutan*) and *N. mutabile* Blume (*Pulassan*) from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. "*Rambutan*. A handsome spreading tree, native of Malaya, yielding a profusion of bright red or orange-yellow fruits, the latter being produced in large

FRESH FRUITS OF THE LITCHI (*Litchi chinensis* Sonnerat), S. P. I. No. 40850.

The dried litchi or litchi "nut" is already well known on the American market, but the fresh fruit, which is incomparably superior to the "nut," has not yet found its way into our markets. The thin rind, when broken between the fingers and taken off, leaves an ivory white, firm, but very juicy mouthful which melts in the mouth, leaving a rather large, smooth seed behind. It has a fragrance suggestive of some tropical perfume, but also sufficient character to make it generally appreciated and insure a high price being paid for it. The photograph is of a shipment sent from Honolulu, Hawaii, by Mr. J. E. Higgins. The fruits were 16 days on the road and yet reached the department in excellent condition. Natural-size photograph (P13521FS), by Mr. E. L. Crandall, June 24, 1915.



THE OLDEST LITCHI IN HAWAII.

To Mr. Afong, a Chinese gentleman, is due the credit for the first introduction of the litchi tree into Hawaii. In 1870 he brought a plant from his own country and planted it in his dooryard at the corner of South School Street and Nuuanu Avenue, Honolulu. Just how soon it began to bear is not known. In 1896 it was bearing well and it is reported that he sold the crop from it at 3 cents per fruit. Now that the tree is 46 years old it is said to have its off years. Evidently the litchi is a long-lived slow-growing fruit tree. Experiments in Florida and southern California appear to prove the possibility of litchi cultivation on the American mainland as well as on the more tropical islands. Photograph (P11879FS) by Mr. R. A. Young, in Mr. Afong's yard in Honolulu, August 12, 1913.

clusters suspended from the ends of the branches, presenting a very ornamental effect. Each fruit is of the size of a large gooseberry, covered with long soft colored spines, the interior being occupied by a large seed, surrounded by a layer of white opaque pulp (aril), which is of an acidulous agreeable taste. Birds and bats are partial to it. The tree is readily propagated from seed, but the best varieties should be raised by grafts or gootees. Thrives up to 2,000 feet elevation." (MacMillan, Hand book of Tropical Gardening, 2nd Ed., p. 176.) "*Pulassan*. A Malayan tree, similar to *rambutan* in appearance, but differing in the fruit and in the leaves being grey beneath. The fruit is larger than the *rambutan*, of a deep purple brown, with short blunt processes, and according to Ridley, the flavor is decidedly superior to that of the latter fruit." (MacMillan, Handbook of Tropical Gardening, 2nd Ed., p. 176.)

Osterdamia matrella (L.) Kuntze. (Poaceae.) 42389. Seeds from Sydney, New South Wales, Australia. Presented by Dr. J. H. Maiden, Director Botanic Garden. A grass of considerable value on littoral swamps and dry flats near the sea. According to Kirk, it is found sometimes forming a compact turf on dry land, and affording a large supply of succulent herbage for horses, cattle and sheep. Its value, however, in such localities, if bulkier grasses would grow there, must be comparatively little, as, from its close-growing habit, it chokes out all other species. It is evidently much relished by stock, and is worthy of introduction in sand-hill districts near the sea, or saline soil inland. (Abstract from Maiden, Useful Native Plants of Australia, p. 112.)

Prinsepia utilis Royle. (Amygdalaceae.) 42623. Seeds from British India. Presented by Mr. M. Buysman, Lawang, Java. "A shrub, 3 to 5 feet; branchlets green, soft, pubescent when young; pith septate. Leaves 1-5 inches, coriaceous, acuminate, entire or serrate. Flowers $\frac{1}{4}$ inch in diameter, white, usually opening in autumn. Drupes $\frac{1}{2}$ to 2/3 inch, purple, subtended by the withered calyx. Dry rocky hills on the temperate Himalayas, altitude 4,000 to 8,000 feet, from Hazara to Sikkim ascending to 9,000 feet, and Bhotan; Khasia mountains, altitude 5,000 to 6,000 feet." (Hooker, Flora of British India, Vol. 2, p. 323.)

Prunus spp. (Amygdalaceae.) 42439-42440. Seeds from Petrograd, Russia. Collected by Miss Zinaida ab Minkwitz in Turkestan in 1914, and presented by Dr. A. Fischer de Waldheim, Director, Imperial Botanic Gardens. 42439, *P. prostrata* Labill., mountain cherry. 42440, *P. spinosissima* (Bunge) Franch., wild almond.

Sasa albo-marginata (Miq.) Makino & Shibata. (Poaceae.) 42656. One plant from Yokohama, Japan. Purchased from the Yokohama Nursery Company. (See Arundinaria, Bambos, and Phyllostachys introductions.)

Spiraea wilsoni Duthie. (Rosaceae.) 42449. Cuttings from Jamaica Plain, Mass. Presented by the Arnold Arboretum. "Closely allied to, perhaps only a variety of *S. henryi*. It is distinguished among other points by its smooth or slightly silky flower-stalks. Leaves of flowering shoots entire, downy above, duller green." (W. J. Bean, Trees and Shrubs Hardy in the British Isles, Vol. 2, p. 535.) Perfectly hardy and among the most ornamental of all the numerous species and hybrids of this genus. (Sargent, Arnold Arboretum Bulletin, No. 19.)

Strychnos spinosa Lamarck. (Loganiaceae.) 42596. Seeds of Kaffir-orange from Inhambane, East Africa. Presented by Rev. Pliny W. Keys, Methodist Episcopal Mission. "An evergreen shrub 8-10 feet high, seldom a small tree; having decussate short branches often ending in a spine, and obovate 3-5 nerved leaves 1-2 inches long, 3/4-1 inch wide, rounded at the point, tapering to a short petiole, and often with the two sides from the midrib more or less infolded upon one another. Cymes mostly terminal on short twigs, paniculate, rather few-flowered. Calyx-lobes long, subulate. Corolla-tube and segments glabrous, but throat bearded by a complete ring of hairs half as long as the segments. Stamens arising from the base of the corolla-tube, and anthers connected by an interwoven woolly mass. Ovary 1 celled, ovules numerous, surrounding a central free placenta. Fruit size of an orange, or larger, with rind green when young, yellow when ripe, hard shell, and numerous flat seeds lying in acidulous edible pulp. Occurs sparingly along the coast from East London eastward and is more abundant in Natal, Tropical Africa and Madagascar. It is seldom cultivated except as a curiosity, and the natives only eat it when food is scarce. The timber is too small to be of value." (Sim, The Forests and Forest Flora of Cape Colony, p. 274.)

Tamarix spp. (Tamaricaceae.) 42441-42443. Seeds of three species of Tamarix from Petrograd, Russia. Presented by Dr. A. Fischer de Waldheim, Director, Imperial Botanic Gardens. 42441, *T. florida albiflora* Bunge. 42442, *T. karelini hirta* Litw. 42443, *T. pentandra* Pallas. For trial as hedge and windbreak plants in the West.

Uvaria rufa (Dun.) Blume. (Annonaceae.) 42470. Seeds from Manila, Philippine Islands. Presented by Mr. H. T. Edwards, Director, Bureau of Agriculture. "*Banauac; Susong Calabo.* Fruits of this species are oblong, reniform, 3,

sometimes 4 centimeters in length, in bunches of 18 to 20 averaging 115 grams in weight; surface bright red, velvety, ferruginous pubescent; skin thin, brittle; flesh scant, whitish, juicy, aromatic subacid without a trace of sugar; quality rather poor; seeds many. Season, September." (Wester, in Philippine Agricultural Review, Vol. 6, No. 7, p. 321, July 1913.)

Vitis spp. (Vitaceae.) 42477-42519. Hybrid grape cuttings from Palermo, Italy. Received through Mr. F. Paulsen, Director, R. Vivaio di Viti Americane, at the request of the Superior Minister of Agriculture. In 1904, Dr. Clemente Grimaldi wrote concerning his work on the hybridization of grapes: "Notwithstanding the labors given for almost 15 years hybridization, I have believed that I should maintain the utmost reserve in publishing the hybrids and until now I have made known only six, all stocks, which are the following: Nos. 50, 88, 125, 791, 110, and 323. Among the hybrids obtained by me, the following at present give me the hope that they will be of service as direct producers: Nos. 88, 97, 317, 953, 1075, and 1132." These hybrids were requested at the suggestion of Dr. Gustav Eisen, and represent some of the best results obtained from the hybridization of American species with *Vitis vinifera* strains of Italian origin, for the purpose of securing varieties resistant to Peronospora and other diseases. Of the Ruggeri and Paulsen hybrids descriptions have not been accessible, but have probably appeared in later volumes of La Viticoltura Moderna.

Zea mays L. (Poaceae.) 42642. Seeds of Papago sweet corn from Tucson, Arizona. Presented by Mr. George F. Freeman, Acting Director, University of Arizona. "We do not really expect that this will be promising as a sweet corn outside of the Southwest, but some results in eastern Kansas and Nebraska last year indicate that it might prove a valuable silage or forage corn in the humid sections." (Freeman.)

AVOCADOS.

During the past two years the winter-bearing Guatemalan type of avocado has been attracting an increasing amount of attention in Florida. Interest in this type was first awakened by the fruiting of several seedlings at the Miami Plant Introduction Garden, which served to demonstrate that this remarkable type would mature its fruits in Florida at the precise season of the year when avocados are most desired. Heretofore the avocado crop has commenced in July or August and lasted until December, with a few

late fruits occasionally hanging on the trees until the end of January or February. Trapp, the latest commercial variety, matures its fruit in late fall, and frequently carries some of the crop until the first of January, but after this time the quantity of avocados marketed from south Florida has been negligible. With the Guatemalan type it will be possible to supply the markets abundantly from December to April, the season of the year when fresh fruits are scarce and when, consequently, there should be an excellent demand for avocados. In the past it has always been the latest avocado which brought the highest prices. The Guatemalan type has an additional advantage in its thick, hard skin, which makes the fruit an excellent shipper. In quality some of the varieties of this type are splendid excelling, in all probability, most of the summer-fruiting varieties which are grown in Florida. The first trees of this type which came into bearing at Miami were grown from seeds sent in by G. N. Collins from Guatemala in 1901. None of these seems likely to become of importance as a commercial variety, but they have served to point out the value and possibilities of this type for Florida. Another seedling (S.P.I.No. 26710) of the same type, grown at the Miami Garden from a seed sent from Los Angeles, Calif., in 1908, has proved to be a first-class fruit, and has been considered worthy of propagation as a named variety. This fruit, which is now called Taylor, has been in bearing at Miami for 3 years. Its origin and history are as follows: In 1908 J. H. Walker of Hollywood, Calif., sent fruits of two seedlings growing on his place to W.A.Taylor, pomologist of the Department at Washington. These varieties, though unamed at that time, have since been called "Challenge" and "Royal". Mr. Taylor transmitted one of the seeds to the Office of Foreign Seed and Plant Introduction, and it was sent to Miami to be grown. It is not known whether this seed was from the Challenge or Royal. The variety is now being propagated and disseminated at the Miami Garden. Another promising avocado which has recently been propagated rather extensively at the Miami Garden is Butler, S.P.I. No. 26690. This is a summer-ripening fruit of the West Indian type, and hence scarcely so interesting at the present time as a variety of the winter-bearing Guatemalan type. However, a medium sized, prolific summer variety of good quality has not yet become established commercially in south Florida, and it would seem that in Butler we have a fruit of considerable merit. Butler originated as a seedling at the Miami Garden, the seed having been received from C. W. Butler, of St. Petersburg, Fla., in 1904. The tree came into bearing in 1909, and has proved to be un-

usually prolific. The fruit weighs about a pound, is oblong to obovate in form, light green, with flesh of excellent flavor and quality. Attention is now being centred on the Guatemalan type at the Miami Garden. A variety introduced from Guatemala two years ago by O. F. Cook of the Bureau (S.P.I. No. 38549) is being propagated, and should come into bearing within another year or two. The variety Nutmeg, (S.P.I. No. 36604) from Honolulu, came into bearing last year, but has not yet had sufficient trial to permit an accurate estimate of its value.

NOTES FROM CORROSPONDENTS ABROAD.

Mr. J. H. Cameron writes from Londiani Farms Limited, Londiani, British East Africa, May 1, 1916.

"I wonder if you would be interested to read a few lines descriptive of this extraordinary country in regard to its flora--of its fauna you will of course have read in Mr. Roosevelt's book 'African Game Trails'. I am living in a part where Mr. Roosevelt did quite a lot of his shooting and do quite a lot of it myself; thousands of head of great antelope and other game roam on this estate. I am the manager of a farm of thirty thousand acres situated exactly on the equator; but at an elevation of from eight thousand to ten thousand feet above the level of the sea. On account of this great elevation the climate is most salubrious; I have never known the temperature to rise above 86° F. or drop below 45°. We have a large rain-fall too, so that we can and do grow almost anything.

"On this estate flax is the main industry; we both grow and manufacture the fibre and it commands a price on the London market that compares well with the best Belgian and French flax. On account of the unfortunate destruction of the first named country we are of course experiencing a boom in price. We also raise a large number of cattle, using the native cow as a basis and crossing it with an imported English Shorthorn bull. We shall then breed up from that cross to something better.

"At our nine thousand foot level we work the forests, cutting the timber, most of which is sold in the colony but some we send to England, more especially the cedar, *Juniperus procera*, a splendid tree growing 150 to 200 feet high. We ship it in baulks 12" by 12" up. I do not know what they resaw it into in England, but here we build our houses with it, inside and out; we also saw it up in a special mill for pencil cedar. *Olea hochstetteri* (native name *m'shraghue*), a fine olive: this wood we saw into ties for the Uganda Railway, and for the new railways that our military authorities are

pushing forward every day. We also cut it into wagon parts, bridge material and furniture; it is the hardest wood I have ever known with the exception of the Quebracho that I came across in the forests of north Argentine. Another olive we have, *Olea sp.* (native name *m'weri*), much lighter than the other olive, but very tough. It is as red as rosewood, used for ox yokes and furniture. There is still another Olea called brown olive, a very handsome wood used for hubs, spokes and felloes for completely making jinrickshaws, a form of vehicle much used in Mombasa, Nairobi and other towns.

"For most of the local building *Podocarpus gracilior* takes the place of the pines, etc., of Europe and North America. It is a splendid tree with a perfectly straight bole for 80 or more feet. It is the principal forest tree at the 7000 and 8000 feet level. The cedar goes higher; I have cut it at 9548 feet. Above that the forests dwindles out and it becomes dense bamboo (and buffalo), the latter a very nasty customer to meet. The pasture on these hills at 9000 and 10000 feet is the finest I have ever seen, not even excepting England. Much lower down at from sea level to 1000 feet grow mangoes and all the tropical trees, palms, dracaenas, etc.

"Growing on these hills but having no utility purposes we have a giant heath which I call *Erica gigantea*, 25 feet high. It usually grows in broken gullys where grass will not hold and is favourite 'cover' for lions. *Lantana ericoides* grows on the outer edge of the forest and the roadsides, as also does heliotrope, a giant asparagus (edible), an herbaceous Althea or Hibiscus, and many beautiful flowers whose names I know not. In my garden I grow oranges, mandarins, lemons, limes, loquats, coffee, and tea. Coffee is a great industry at the 6000 foot level. In one small district of Kisambu near Nairobi there are 12000 acres planted in coffee. I also have strawberries (imported), native raspberries, Cape gooseberries, which is not a gooseberry at all but an excellent fruit. I will send you some seed as it would grow well in all your non-freezing states and will even stand a few degrees of frost as I have seen it do so at 10000 feet. I have what are called tree tomatoes, the bush (perennial) grows 8 feet high with large shiny leaves that get smaller as the tree gets older. The fruit looks like a large reddish purple plum but has many small seeds like the tomato and a very pleasant taste, and is used for pies and puddings. It bears profusely all the year round.

In the matter of vegetables we grow here everything that is found in an English or North American garden only they grow 12 months in the year.

A CHERIMOYA SUGAR APPLE HYBRID (*Annona cherimola* × *A. squamosa*).

In an attempt to combine the good qualities of the Cherimoya and the Sugar Apple Mr. Edward Simmonds has succeeded in producing a hybrid between these two species. The tree shown in the illustration is one of these hybrids. It has already borne a number of fruits of most excellent quality and appearance. The fruit appears to be intermediate between the two species, and the tree shows an unusual vigor as is common in many hybrids. There are many species of Annona and this hybrid indicates the possibility of mingling them into superlative hybrid varieties. For this purpose a collection of Annona species has been assembled at the Miami Field Station. Photograph (P16155FS) by Wilson Popenoe, Miami, Fla., August 10, 1914.

PRUNUS GLANDULOSA Thunberg, S. P. I. 38337.

A very ornamental Chinese shrub, called *Yü hua mei*, having small, double white flowers. Numerous varieties of the species are in cultivation, some with rosy flowers, others with white flowers, dotted with red. Photograph (Chico 659) by R. L. Beagles, Test Nursery, Chico Field Station, April 15, 1916.

In my flower garden I grow the most beautiful roses I ever saw. There is not a day in the year that I am without their blooms; also all the old English garden perennials, annuals, etc. *Passiflora edulis* and its cousin *P. trifasciata* cover my house and mixed up with it are *Mandevilla suaveolens* and *Cobaea scandens*, the latter through with very much larger flowers than I ever raised in either Virginia or Devonshire.

"We have 250 acres in black wattle, *Acacia decurrens*. It is now just 3 years old and is 30 feet high. In another year we shall cut it and strip the bark which is used for tanning in Europe. Sisal hemp is a great industry here, the fibre of *Agave rigida* var. *sisalana*. It is used for cordage, but of course you grow it in Florida so know all about it. Among other things that we grow here, but at different elevations, are coffee, wheat, rubber, cotton, cocoanuts, mangoes, and in live stock, cattle, horses, pigs, sheep, ostriches.

"The dasheen, by the way, has been grown here by the natives from long before the coming of the white man. They call it *Miwoo* pronounced meewo. One tribe called Kikuyus are never without it. It would be interesting to know how it came here, but of course the native knows nothing of his history and cares nothing. Unlike the tribes of south and central African savages, these of East Africa have no religion or superstitions. They worship one god which they call *Tumbo* and it means their stomach. The only thought they have beyond that is how to acquire as many wives as possible. Natives use a nickname for everybody; they never learn one's real name but name one according to any peculiarity they may have.

"The agricultural tribes are great farmers. Their methods are those of the stone age. The women do all the work; the men hunt, drink, steal, and stand around naked and discuss the value of the goats, sheep and cattle which they barter for more wives. The amount of maize grown and exported by just one tribe, the Kavirondo who live along the shores of Lake Victoria Nyanza, is astonishing. Another tribe raises quantities of beans, peas and potatoes. Today I have stood on top of a great hill on this farm, 10000 feet high, but only about 1500 feet above the surrounding table land, and looked down through field glasses into Lake Victoria 80 miles away to the west, Kilimanjaro 19000 feet high away to the southeast, over to Lakes Rudolf and Baringo to the north, and German East Africa 30 miles to the south. At the foot of the hill great herds of antelope and countless zebra graze. I have caught some of the zebra foals and intend when they are fully grown to cross them with my Somali pony stallion.

I am sending you seeds of a fine Amaryllis which grows here on the veldt, and which we wrongly call the Veldt Lily. It may be Hippeastrum; its flowers are immense white with pink stripes; its bulb is a foot long. It seems to thrive in the very dry weather."

SCIENTIFIC STAFF OF THE OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION OF THE BUREAU OF PLANT INDUSTRY.

Washington Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist, in charge of Plant Protection and Propagation Investigations.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.
David A. Bisset, Assistant in Plant Introduction.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 121. MAY, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page		Page
Actinidia	997	Cornus	1000	Oxytenanthera	1002
Alpinia	997	Cotoneaster	1000	Paulownia	1003
Ampelopsis	997	Deutzia	1000	Pavetta	1003
Annona	997	Diospyros	1001	Pistacia	1004
Artemisia	998	Engelhardtia	1001	Potentilla	1004
Begonia	998	Hedysarum	1001	Pyrus	1004
Britoa	998	Juniperus	1001	Ribes	1005
Buddleia	998	Liquidambar	1001	Rodgersia	1005
Caryopteris	999	Lonicera	1001	Rubus	1005
Cicer	999	Malus	1002	Solanum	1006
Citrullus	999	Nephelium	1002	Syringa	1006
Clematis	999	Olea	1002	Viburnum	1006
Coriaria	999	Osterdamia	1002	Vitex	1007

Plates:

Pl. 193. Two rare hedge plants in Golden Gate Park, San Francisco, Cal.

194. A Davidiana peach tree in California, *Amygdalus davidiana.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 20, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Actinidia callosa henryi Maxium. (Dilleniaceae.) 42683. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. A climbing plant introduced from central China by Wilson. Leaves persistent, coriaceous, lanceolate, finely dentate, 15 cm. (6 in.) long. They are bronze red when young passing into a metallic green when mature and in autumn take on a beautiful reddish color. This plant is entirely distinct from its relatives and is remarkable for the size of its leaves. Found by Wilson and Henry in western Hupeh and Szechwan as a climber reaching a height of 7 meters (23 feet), with fragrant white flowers and greenish ovoid or elongate fruit.

Alpinia exaltata (L.f.) Roem. & Schult. (Zingiberaceae.) 42799. Seeds received through Mr. W. E. Safford of this Bureau. "A plant belonging to the ginger family widely spread in tropical America. In Porto Rico it is commonly known as **Bihao** or **Vijao grande.** The broad thin membranaceous leaves usually acuminate at the apex and tapering at the base, are somewhat like those of a Canna. The inflorescence is a long simple raceme, with magenta colored or reddish-purple, peduncle and bracts, and yellow flowers. The fleshy, obovoid or oval fruit usually borne on a recurved pedicel (when mature) is black at length and yields a dye of some importance." (Safford.)

Ampelopsis leeoides (Maxim.) Planchon. (Vitaceae.) 42684. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. An Asiatic species introduced by Wilson, very distinct and remarkable because of its pinnate leaves, composed of five very long leaflets, pointed and shining. This plant is very vigorous, and may attain several meters in height and will cover walls and trellises well. A southern Japanese species allied to *A. megalophylla.*

Annona sp. (Annonaceae.) 42723. Seeds of **Guanavito** from San Martin de Loba, Bolivar, Colombia. Presented by Mr. H. M. Curran. "A low shrub with glossy ornamental leaves and habit of Crataegus. Fruit orange red, specimens obtained about two inches in diameter, flesh rather dry as compared with cultivated varieties. Would make a good hedge. Lowlands, in dense thickets." (Curran.)

Artemisia cina Berger. (Asteraceae.) 42682, 42791. Seeds from Russia. Presented by Dr. A. Fischer de Waldheim, Director, Royal Botanic Gardens at Petrograd, and A. Rolloff, Director Botanic Garden at Tiflis, Caucasus. The plant is a low and straggly undershrub, with erect branches, abounding in the deserts of Turkestan, where all the drug santonica is collected in July and August by native tribes. It belongs to a perplexing group of species of this difficult genus, variously regarded by different botanists as distinct species or as varieties of the polymorphic species, *A. maritima* L. The drug is composed of the dried unexpanded flower heads, and forms a yellowish green (at length greenish brown) somewhat glossy, mobile mass, having a strong and peculiar, somewhat camphoraceous odor and an aromatic and bitter taste. The drug santonin is obtained from these flowerheads, and is used as an anthelmintic especially for round worms.

Begonia sp. (Begoniaceae.) 42820. Seeds from Rama, Nicaragua. Presented by Mr. Carlos Berger. "A plant which has some resemblance to *Hydrastis canadensis*. The Indians use the rhizome as a violent emetic in case of snake bite, poisoning, etc., and it acts so strong ly that it produces the vomiting of blood in certain doses. The leaves are healing and are used in swellings and skin eruptions. It is curious that the land turtles are excessively fond of the leaves of this plant and if there are any of such turtles around you might be sure to find them near this plant." (Berger.)

Britoa acida (Mart.) Berg. (?) (Myrtaceae.) 42725. Seeds from San Martin de Loba, Colombia. Presented by Mr. H. M. Curran. "Large fruited guava-like fruit which is soft, yellow, with few seeds, very acid and juicy." (Curran.)

Buddleia nivea yunnanensis (Dop.) Rehder & Wilson. (Loganiaceae.) 42685. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. Of the same group as *B. variabilis*. Branches and lower sides of the leaves whitish. It is remarkable for its very beautiful, delicate mauve flowers, which have a very pleasant perfume, and are arranged in a large lengthened spike. Flowers from July to October. Height 1½ to 3 meters. Wilson says this variety is much more widely distributed than the type and is readily distinguished by its usually solitary panicle and much

larger flowers attaining 5 mm. in diameter; the leaves are usually pubescent above and vary in size and are sometimes nearly entire, coarsely serrate or sinuately toothed. From western Szechwan.

Caryopteris mongholica Bunge. (Verbenaceae.) 42776. Seeds from Madrid, Spain. Presented by the Curator, Botanic Gardens. An ornamental, woody plant grown for its lavender-blue flowers, profusely produced in the fall. The flowers are in densely clustered, axillary and in this species less numerous but larger than the commonly known *C. incana* (*C. mastacanthus*). (Adapted from Bailey, Standard Cyclopedia of Horticulture, Vol. 2, p. 679, 1914.)

Cicer arietinum L. (Fabaceae.) 42761-42764. Seed of chickpeas from Barcelona, Spain. Procured through Mr. Carl Baily Hurst, American Consul General.

Citrullus vulgaris Schrad. (Cucurbitaceae.) 42716. Seeds of **Tsama melon** from Johannesburg, Union of South Africa. Presented by Mr. J. Burtt-Davy, Botanist, Agricultural Supply Association. The famous forage melon of the Kalahari desert, which furnishes forage for cattle on the sandy plains flourishing under temperatures of 110° on almost pure sand with very low rainfall. Probably of no value for table use, but may be useful in melon breeding.

Clematis armandi Franchet. (Ranunculaceae.) 42686. One plant from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. A new climbing Chinese species, exceptional in its strongly persistent, coriaceous, trifoliolate, dark, shining blue-green leaves. Flowers pure white, 5 cm. across, in many-flowered axillary panicles. Flowers in April. Climbs to a height of 5 meters or more. Collected by Wilson and Henry in western Hupeh and Szechuan. Called **Wei-ling-hsien** by the Chinese in Hupeh.

Coriaria thymifolia Humb. & Bonpl. (Coriariaceae.) 42817. Seeds from Ambato, Ecuador. Presented by Professor Abelardo Panchano, Ambato Agricultural School, through the American Consul General at Guayaquil. "This Coriaria is known under the Quichua name of **pinan,** but in the northern provinces the plant is talked about as **Shanzhi** or **Zhanzhi.** Its berries are rather poisonous, eaten in some quantity, as I had reason to verify

when a boy. The bark and the roots are rich in tannin as is the case in the *C. myrtifolia* of the European shores of the Mediterranean sea. The ink obtained from the fruit has a beautiful violet color that changes to black and, within a few hours, to reddish; it has an ancient fame of being indelible, and we believe this ink would be very good if we could, by some means, fix its color. It is said that during the colonial times a Spanish ship sunk, and it was possible to save some papers after they had been under the water because they had been written with **Shanzhi** ink. It is added that there was a king's order to write with this ink all papers of importance." (Panchano.)

Cornus paucinervis Hance. (Cornaceae.) 42759. Seedlings of **Cornel** from Rochester, N. Y. Presented by Mr. John Dunbar. Shrub 1 to 3 meters tall, white flowers, black fruit. From western Hupeh and western Szechwan. (Adapted from Plantae Wilsonianae, Vol. 2, part 3, p. 577.)

Cotoneaster spp. (Malaceae.) 42689-42690. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. *C. crenulata* (Don) Koch. 42689. Var. *yunnanensis*. A new variety from seed received from China by Mr. Maurice L. Vilmorin, differing from the type in its greater vigor, its longer spines and its less dentate leaves. The fruits of a brighter coral red are smaller but much more abundant, and hang on the shrub until January. It attains a height of from one to three meters. *C. nan-shan*, 42690. Introduced from China by Mr. Maurice L. Vilmorin. This species is well characterized by its stiff branches and small foliage. Flowers white, fruits very large, bright red, ripening in October. Serves admirably for the decoration of rock slopes and rockeries. Height 15 to 20 cm.

Deutzia longifolia veitchii. (Hydrangeaceae.) 42691. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. Introduced recently from Yunnan, this new Deutzia is without doubt the one whose flowers are the largest and the most brilliantly colored. They are of a beautiful rose, with deep lilac coloring inside and out, arranged in numerous small clusters along the branches. They bloom in May. The plant is very vigorous, hardy, flowers very young and

is easily forced. It is said to be one of the most interesting novelties introduced from China recently. Received a Certificate of Merit from the National Society of Horticulture of France.

Diospyros kaki L.f. (Diospyraceae.) 42674-42675. Cuttings of two varieties of **sweet persimmon** from Okitsu, Japan. Presented by Prof. Ishiwara, Director, Government Horticultural Experiment Station. Varietal names, **Kuharu** and **Ganzan.**

Engelhardtia aceriflora (Reinw.) Blume. (Juglandaceae.) 42765. Seeds from Nice, France. Presented by Dr. A. Robertson-Proschowsky. A very tall tree, compound leaves somewhat like those of a walnut, and inconspicuous flowers disposed in drooping, spicate panicles. These are succeeded by little fruits which are about the size of a pea, each seated on the base of a three lobed, beautifully veined and coloured bract. These are often more than a foot long and hang very gracefully among the foliage. (Adapted from Lindley, Treasury of Botany, part 1, p. 451, 1899.)

Hedysarum boreale Nuttall. (Fabaceae.) 42676. Seeds from Saskatoon, Saskatchewan, Canada. Presented by Mr. W. E. Lake, University of Saskatchewan. A perennial herb with compound leaves and showy racemes of many deflexed, magenta to white flowers. Native from Newfoundland, northern New England to Alaska. Introduced for breeding experiment to produce a hardy species suitable for forage.

Juniperus procera Hochst. (Pinaceae.) 42833. Seeds of **East African cedar** from Asmara, Eritrea, Africa. Presented by the Direzione di Colonizzazione. A tall conifer, said to be 100 to 150 feet high, with straight trunk; and to yield durable and valuable timber. Native of the high mountains of British East Africa.

Liquidambar formosana Hance. (Hamamelidaceae.) 42822. Seeds of **Fung hsiang shu** from Nanking, China. Presented by Mr. John H. Reisner at the request of Rev. Joseph Baillie, University of Nanking. A Chinese **sweet gum** up to 120 feet in height, having somewhat the appearance of the sweet gum, *L. styraciflua*, but with smaller, usually three lobed leaves.

Lonicera similis delavayi (Franchet) Rehder. (Caprifoliaceae.) 42692. Plants from Paris, France. Purchased

from Messrs. Vilmorin-Andrieux & Company. A very vigorous new **honeysuckle** from western China, with long climbing branches, and lengthened, very velvety leaves. The young branches are covered their whole length with odorous flowers, at first white, then yellow, arranged in pairs and continuing to appear from June until frost, with an abundant flowering in autumn.

Malus astracanica Dum. Cours. (Malaceae.) **Apple** seeds from Leiden, Holland. Presented by the Director, Botanic Garden. This species is perhaps native of southern Russia and western Siberia. It resembles *M. pumila* in the fruit and the pubescence of the leaves, but is nearer to *M. baccata* in the form, serration and texture of the leaves and in the longer-stemmed fruits and leaves. Introduced for breeding work of the Office of Horticultural and Pomological Investigations.

Malus glaucescens Rehder. (Malaceae.) 42760. Seedlings from Rochester, N. Y. Presented by Mr. John Dunbar.

Nephelium lappaceum L. (Sapindaceae.) Seeds from Buitenzorg, Java. Presented by Dr. & Mrs. A. Hagedoon. "One of the finest **Kapoelasans** (hairless **rambutan**). The fruits we took them from were of exceptional good taste, flesh sweet to the stone, and stone as free as any we saw; fruits very large, dark red." (Hagedoon.)

Olea chrysophylla Lamarck. (Oleaceae.) 42834. Seeds from Asmara, Eritrea, Africa. Presented by the Direzione di Colonizzazione. Small tree, noteworthy because of the drab or golden color of the under surface of the leaves; flowers small, in axillary panicles; drupe rather large and blackish, globose or somewhat ellipsoidal. Native of tropical Africa. (Bailey, Standard Cyclopedia of Horticulture, Vol. 4, p. 2333, 1916.)

Osterdamia matrella (L.) Kuntze. (Poaceae.) 42678. Roots from Taihoku, Formosa, Japan. Presented by Mr. M. Takata, Department of Productive Industries. A grass from the Far East, often known as *Zoysia pungens*, which seems to be succeeding in Florida as a lawn grass.

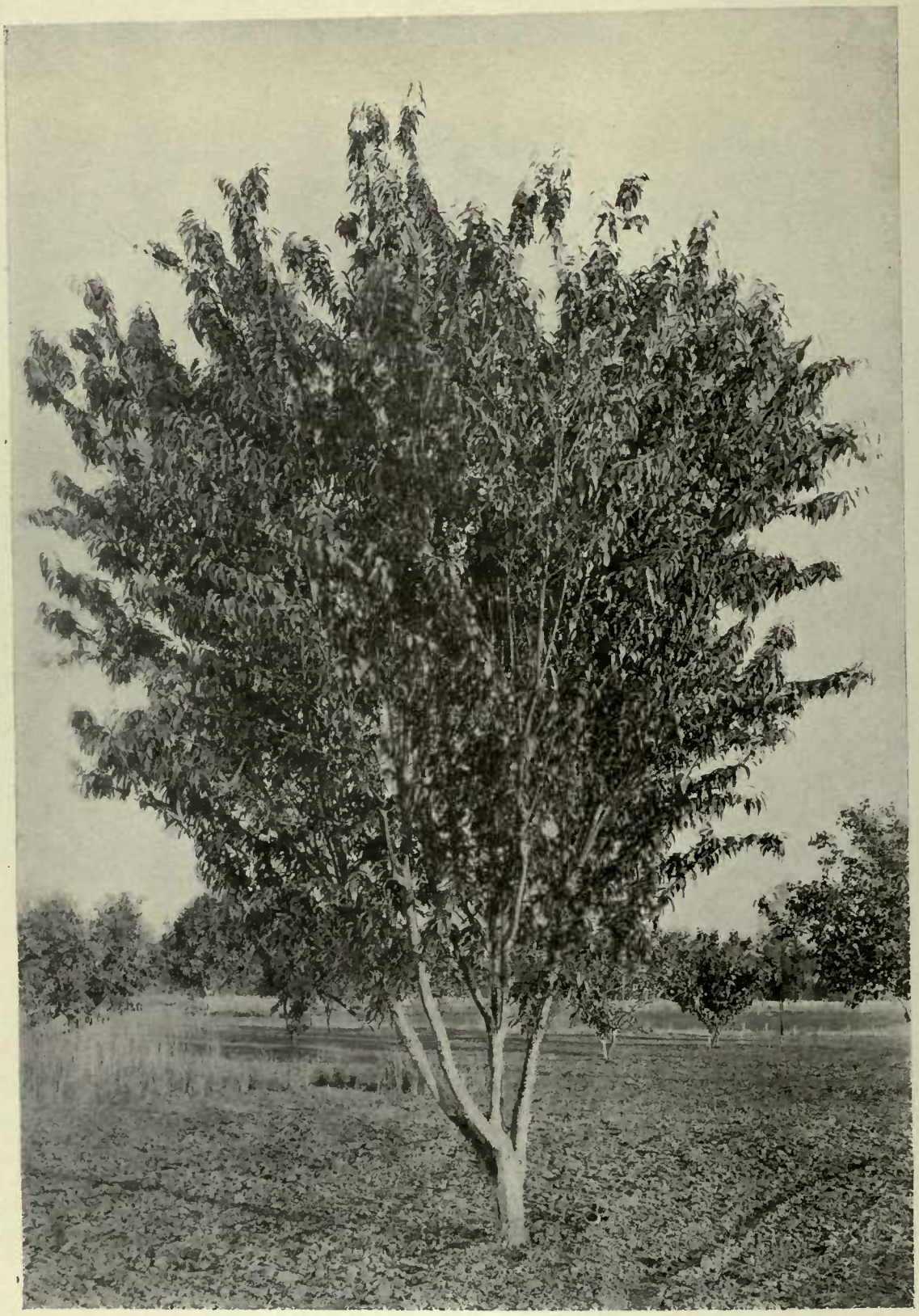
Oxytenanthera abyssinica (Rich.) Munro. (Poaceae.) 42835. Seeds from Asmara, Eritrea, Africa. Presented by the Direzione di Colonizzazione. A large bamboo 25

TWO RARE HEDGE PLANTS IN GOLDEN GATE PARK, SAN FRANCISCO, CAL. MYRTUS LUMA (EUGENIA APICULATA) IN BACKGROUND AND LONICERA NITIDA IN FOREGROUND.

The *Myrtus luma* is a handsome evergreen from Chile, and although it grows to 20 feet in its native habitat it lends itself admirably to trimming, and its small, glossy green leaves and dainty small white flowers combined with its compact growth make it an admirable hedge plant in the cool climate of San Francisco. It has been grown in England, but kills back at Kew. It deserves a wider trial in the Pacific coastal region.

Lonicera nitida is a dainty evergreen bush honeysuckle growing to 6 feet in height, reminding one of a privet, but having much more style than most of the privets. Its polished dark-green leaves, small fragrant creamy white flowers, and ornamental blue purple fruits, and the fact that it is hardy in Chicago and in the Arnold Arboretum, from which institution it has been distributed to some extent, make it a very promising shrub for general use. It grows easily from cuttings.

Photographed by G. Moulin, San Francisco, Cal.



A DAVIDIANA PEACH TREE IN CALIFORNIA, AMYGDALUS DAVIDIANA, S. P. I. No. 18262.

The great vigor and healthy appearance of this Chinese peach species, which is used as a stock in China, has attracted a great deal of attention among orchardists and nurserymen who have seen the trees, of which the photograph shows one now growing at the Chico Field Station. The tree shown was planted as seed in March, 1906, and is now 20 feet high and has a trunk circumference of 20 inches 1 foot from the ground. With plums, peaches, apricots, and almonds it makes a perfect union. Photographed (P19655FS) by P. H. Dorsett at Chico, Cal., May 14, 1916.

to 50 feet high and 1½ to 3 inches in diameter. Reported to have a wide range in Africa. This species has a very different appearance from the remainder of the genus, but the structure of the spiculae in all the species is very similar. For technical description see Colonel Munro's Monograph of the Bambusaceae, in the Transactions of the Linnean Society, London, Vol. 26, p. 127, 1870.

Paulownia duclouxii Dode. (Scrophulariaceae.) 42693. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. A recently introduced tree from Yunnan, China, differing from the common Paulownia in its white flowers, slightly rosy, and without spots. Flowers at the end of winter before the leaves appear.

Pavetta zimmermanniana Valet. (Rubiaceae.) 42767. Seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director Botanic Gardens. A small rubiaceous tree or shrub, with opposite, nearly elliptic leaves and clusters of small, slender-tubed white flowers. "The remarkable researches of Zimmerman and Faber detailed in the Jahrbücher für wissenschaftliche Botanik, vol. 51, p. 285, 1912, and vol. 54, p. 243, 1914, make this species of unusual interest. Faber has proven that the leaves of this species of Pavetta and of several others of this genus as well as of the genus Psychotria and possibly other genera of the Rubiaceae contain colonies of a nitrogen-fixing bacteria which he names *Myco-bacterium rubiacearum*. The bacteria of this species inhabit almost invariably the micropyle of the young seed and when it germinates, although not a motile form, grow through certain stomata of the very young leaves and into the intracellular spaces formed by the leaf tissues around these stomata. Reacting one on the other, there are formed through the growth of the epidermis cells cavities which later close entirely and make bacterial knots which are deeply imbedded in the leaf tissues. A single leaf may have several dozen of these symbiotic bacterial knots. Faber was able by treating the seeds with hot water and sublimate solution to kill the inhabiting myco-bacteria and later infect part of the seedlings grown from their seeds with pure cultures of the bacterium. The artifically infected seedlings grown in soil free from combined nitrogen grew well and remained healthy for four months whereas those

not so infected turned yellowish-white and died in three or four weeks. The plants from unsterilized seeds produced leaves with many more bacterial knots on them than did those from sterilized seeds which were later artifically inoculated. In view of the fact that these Rubiaceae with bacterial knot bearing leaves occur in many parts of the tropics and that in India at least the value of their leaves for manure has long been recognized, and judging from the value of the Leguminosae as nitrogen collectors, the suggestion of Faber is well worthy of consideration, that we may have in these tropical trees and shrubs, plants of positive agricultural value for the tropical planter. Even in Florida the value of the mulch formed by the leaves of leguminous and other plants is keenly appreciated by the best cultivators and it may be possible to find suitable small shrubs of Pavetta or other Rubiaceae which will be worth while growing for their nitrogen-fixing leaf bacteria in the orange and avocado orchards of southern Florida or wherever the climate will permit of their cultivation." (David Fairchild.)

Pistacia chinensis Bunge. (Anacardiaceae.) 42823. Seeds of **Huang lien shu** from Nanking, China. Presented by Mr. John H. Reisner at the request of Rev. Joseph Bailie, University of Nanking. A tall, deciduous tree, strikingly ornamental, with large pinnate leaves, red when young, changing to vivid green in summer and flaming scarlet yellow in fall. Berries inedible. Many trees previously introduced have succeeded in the dry south west and an avenue has been planted at the entrance to the Chico Field Station.

Potentilla fruticosa vilmoriniana Komarow. (Rosaceae.) 42694. Plants from Paris, France. Purchased from Vilmorin-Andrieux & Company. Introduced from China by Mr. Maurice L. Vilmorin, this new Potentilla forms a tufted shrub, very erect, a meter in height, with silky very silvery foliage, and covered during the whole season with pale sulphur yellow flowers, larger than those of the species. Very suitable for massing in a shrubbery border.

Pyrus spp. (Malaceae.) 42779, 42796-42798. Seeds of four species of **pears** from Madrid, Spain, and Leiden, Holland. Introduced for the work of the Office of Horticultural and Pomological Investigations. 42779.

Pyrus canescens Spach. A probable hybrid between *P. nivalis* and *P. salicifolia*, between which species it is almost intermediate. This tree is very handsome in spring with its very white young leaves, which become shiny, dark green above when mature. The fruit is pale green, much shorter stock than that of *P. nivalis*. 42796. *Pyrus amygdaliformis* Villars. A large, rounded shrub or small tree, occasionally 20 feet high. Leaves very variable in shape and size; white flowers one inch across appearing in April; fruit orange-shape, about an inch across, yellowish-brown, on a short thick stalk. Not especially valuable for the garden except for its picturesqueness when old. Native of the Mediterranean region. 42797. *Pyrus nivalis* Jacq. A small sturdy tree with woolly, white young shoots and young leaves; the flowers pure white, one and one-half inches across, produced in April in conspicuous clusters. Fruit one and one-half inches or more wide, rounded, yellowish-green. This eastern European tree is very beautiful early in the season because of its pure white leaves and numerous flowers. In France the trees are cultivated for their fruits which are eaten when bletted. 42798. *Pyrus sinai* Desf. This **pear**, which is related to *P. amygdaliformis*, is supposed to have originated in Asia Minor on the Islands of the Greek Archipelago. Its leaves in spring are white with down, becoming smooth and shiny later.

Ribes spp. (Grossulariaceae.) 42739, 42749, 42780-42781. Seeds of **currants** from Petrograd, Russia, Nancy, France, and Madrid, Spain. Introduced for the work of the Office of Horticultural and Pomological Investigation. 42739. *Ribes graveolens* Bunge. 42749. *R. lobbii* A. Gray. 42780. *R. flavum* Berland. 42781. *R. multiflorum* Kitaibel.

Rodgersia aesculifolia Batalin. (Saxifragaceae.) 42695. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. A vigorous plant newly introduced from China, with large rhizomes and slender petioles supporting six large umbellate, oval leaves, heavily veined and of a beautiful dark green, resembling those of the chestnut. Flowers white, in a long panicle, 75 cm. long, appearing in June. Flourishes in cool, half-shaded, peaty soils.

Rubus spp. (Rosaceae.) 42750-42757, 42766, 42782-42789. Seeds of 17 species of Rubus from Nancy, France,

Amsterdam, Holland, and Madrid, Spain. Introduced for the work of the Office of Horticultural and Pomological Investigations. Most of them are unusual European species rarely grown except in botanical gardens. 42750. *R. discolor* Weihe & Nees. 42751. *R. fastigiatus* Weihe & Nees. 42752. *R. godronii* Lecoq & Lamotte. 42753. *R. hirtus* Waldst. & Kit. 42754. *R. lejeunei* Weihe & Nees. 42755. *R. nitidus* Weihe & Nees. 42756. *R. rudis* Weihe & Nees. 42757. *R. wahlbergii* Arrhenius. 42766. *R. ulmifolius bellidiflorus* (Koch) Focke. 42782. *R. hoffmeisterianus* K. & B. 42783. *R. inermis* Pourr. 42784. *R. leucostachys* Schleicher. 42785. *R. lindleyanus* Lees. 42786. *R. rhamnifolius* Weihe & Nees. 42787. *R. sanctus* Schreber. 42788. *R. thyrsiflorus* Weihe & Nees. 42789. *R. vestitus* Weihe & Nees.

Solanum bullatum Velloso. (Solanaceae.) 42815. Seeds from Lavras, Minas, Brazil. Presented by Mr. Benjamin H. Hunnicutt, Director, Instituto Evangelico, Escola Agricola. "**Capoeira branco.** Relished by cattle as well as by horses. It seems to have no poison effect whatever on the stock eating it." (Hunnicutt.) A South American plant which may possibly be valuable as a forage plant because of its large per centage of protein. The analysis of the leaves and branches shows 20.88 per cent of protein in the leaves and 14.06 per cent of protein in the branches.

Syringa giraldii Sprenger. (Oleaceae.) 42696. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. Originally from the north of China, this **lilac**, which is still little known, is chiefly remarkable for its early flowering which takes place in Paris at the beginning of April. The beautiful flowers are white, slightly marked with lilac, in loose thyrses and as odorous as those of the common lilac. It reaches a height of three to four meters.

Viburnum spp. (Caprifoliaceae.) 42697-42698. Plants from Paris, France. Purchased from Messrs. Vilmorin-Andrieux & Company. 42697. *V. carlesii* Hemsley. A Korean shrub recently introduced and little known, reaching a height of about a meter, of open habit. With opposite subsessile, rounded pubescent, deciduous leaves, and very odorous white flowers, flushed with rose, in terminal umbels, appearing in May. Flourishes in cool, semishady places with little lime and forces very easily; recommended for border for mass plantings of rhododendrons and azaleas. 42698. *V. davidii* Franchet.

Introduced from China through the efforts of Mr. Maurice L. Vilmorin, this new Viburnum is one of the most distinct and most remarkable of the genus. It is a low plant, entirely hardy, with large persistent, shining leaves resembling those of a rhododendron, the shoots of the year terminating in an umbel of white flowers, appearing in April. These flowers are succeeded by steel-blue fruits, ripening in autumn. It attains a height of from 25 to 50 cm. and flourishes in shady, peaty soil. Received a Certificate of Merit from the National Society of Horticulture of France in 1913.

Vitex lucens T. Kirk. (Verbenaceae.) 42790. Seeds of **Puriri** from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. A fine tree, from 50 to 60 feet in height, often called the New Zealand Oak on account of the strength and durability of its timber. It is not injured by damp or exposure, and is therefore extremely valuable for ship-building purposes. The logs are often perforated with large holes, but these do not affect the timber, except in so far as it has sometimes to be cut to disadvantage. These holes are made by a soft-bodied grub, which develops into the puriri moth. The leaves of the puriri are handsome, being of a bright, glossy green, the leaflets 3 to 4 inches long. The flowers are in axillary panicles, 4 to 8 together, pink or red, irregular in shape, and with exserted stamens. The roots of the puriri never penetrate deeply into the ground, but lie near the surface, so that the tree is easily blown over in a gale of wind. It is endemic in New Zealand, and is restricted to the northern part of the North Island. It is easily cultivated, and flowers more or less all the year round. (Laing & Blackwell, Plants of New Zealand, p. 350.) "The New Zealand **Puriri** is one of the most handsome trees in cultivation, and worthy of more extensive planting. It transplants well, grows rapidly, and makes a compact tree of symmetrical bushy form, with bright glossy green foliage. It is one of the New Zealand hardwoods used for railway sleepers and is very durable. The berries when ripe, resemble cherries, which all tend to add to its beauty." (Wright.)

Staff Announcements.

Dr. B. T. Galloway, whose resignation from the position of Dean of the College of Agriculture at Cornell University has been announced in the papers, has returned to the Department and has taken charge of two important investigative projects in the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry.

Believing that he has done his share of administrative work and earned the right to pursue studies in agriculture of a purely investigative character, Dr. Galloway has taken hold of the following projects in this Office, viz.:

The *Protection and Propagation of New Plant Introductions* and *Plant Introduction Surveys.* The former project covers a wide field of research, which has in recent years become a necessity owing to the operation of the Act creating the Federal Horticultural Board. The problems are those connected with the production from suspected or diseased plant material brought in from abroad of perfectly healthy young plants suitable for distribution throughout the country. To facilitate this work a special laboratory is being erected adjacent to the inspection house and quarantine enclosure on the Mall and Dr. Galloway expects to occupy this laboratory upon his return from an extended trip which he is now making through the West. This trip is for the dual purpose first of making an investigation of the Plant Introduction Field Stations of the Bureau to ascertain what increased facilities will be required to make them more effective, and second of making a preliminary survey of the plant introductions which have been made into that territory and the possibility of further expansion of their cultivation as plant industries. This latter study is preliminary to the development of Dr. Galloway's second project, which involves the bringing together in a comprehensive way for practical use of all the available information which is required for the organization and successful maintenance of new plant industries brought about through the introduction of new foreign seeds and plants.

Dr. Galloway's itinerary has taken him through Canada, where he has studied the progess of the plant introduction work which was so well begun by Dr. William Saunders. It will take him through to the Puget Sound Region and down the Pacific Coast to southern

California and thence east through the Middle West and south through the Gulf Coast States and into Florida. It will include visits to all the Field Stations of the Office and numerous State Experiment Stations and private experimenters in plant introduction. He is expected back some time in November.

Dr. Galloway assumes his old title of Plant Pathologist, which he retained during all the years of his connection with the Bureau of Plant Industry.

Mr. Frank N. Meyer, Agricultural Explorer of the Office of Foreign Seed and Plant Introduction, who returned last October from a three years' stay in Northwestern China, has finished the writing of his reports and the arranging of his material here in Washington and has sailed for his third Chinese expedition and his fourth into Asia.

It is expected that he will continue his work on the northern fruits and vegetables of China and extend his explorations into the provinces south of the Yangtze River, which is still, so far as plants are concerned, almost an unknown region.

The climate of these provinces which approach the tropics, resembles that of the South Atlantic and Gulf States and although temperatures do not go so low there as they do in our Gulf Region, frosts occur and many plants, it is believed, will be found there which will thrive as far north as the Carolinas.

The hardiness of the giant edible bamboo (a native of South China) in Louisiana and as far north as Savannah is an indication of the possibility of finding important new plants in South China, where we have records already of edible fruited oaks, slightly frost-resistant litchis, southern pears, plums and grapes, and vegetables especially suited for marsh or pond culture.

It is expected that Mr. Meyer will remain in this region about three years and arrangements have been made for him to cooperate with the Philippine Bureau of Agriculture in the handling of such new tropical plant material as he may discover.

Mr. Wilson Popenoe, Agricultural Explorer of the Office, is now in Guatemala investigating the wild plant possibilities of the uplands of that interesting region where many new fruit species and varieties are yet to be discovered which should be brought into culture throughout the tropics. Such fruits and vegetables as the Sapote, Avocado, Annona, Chayote, and many others will be studied by Mr. Popenoe.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations.
David A. Bisset, Assistant in Plant Introduction.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago. Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF DIVISION OF
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 122. JUNE, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1013	Fraxinus	1015
Amherstia	1013	Hibiscadelphus	1015
Annona	1013	Licania	1016
Bactris	1013	Mangifera	1016
Beaumontia	1013	Maytenus	1016
Berberis	1014	Metrosideros	1017
Britoa	1014	Pittosporum	1017
Buddleia	1014	Prunus	1021
Chrysobalanus	1014	Rosa	1017
Cicer	1020	Rymandra	1019
Cucumis	1014	Strychnos	1020
Cucurbita	1015	Theobroma	1020
Diospyros	1020	Ximenia	1020
Feijoa	1020		

Plates:

Pl. 195. Small bearing tree of the Macadamia, *Macadamia ternifolia.*

196. Flowers, leaves, and fruit of the Macadamia, *Macadamia ternifolia.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 30, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia cavenia (Mol.) Bert. (Mimosaceae.) 42861. Seeds from Santiago, Chile. Presented by Sr. Ernesto Palacios, Catholic University. A small Chilean tree, known as cavan, with exceedingly hard wood, durable in moist soil. The spiny plant makes admirable hedges. The tannin from this species is said to be especially valuable for dyeing.

Amherstia nobilis Wallich. (Caesalpiniaceae.) 42902. Seeds from Sibpur, Calcutta, India. Presented by the Curator, Royal Botanic Garden, at the request of Mr. Bernard Coventry, Agricultural Adviser to the Government of India, Pusa. Named in honor of Lady Amherst. A medium sized tree, native of Burma, and considered the most beautiful of all flowering trees. Its immense candelabra-like sprays of red and yellow flowers, drooping from every branch among the handsome foliage, present an appearance of astonishing elegance and loveliness. It is in flower during the greater part of the year, but its chief flowering season in Ceylon is from January to April, i.e., the dry season. The tree thrives in the moist low country up to 1600 feet elevation, and requires rich and well-drained soil. It does not seem to flourish near the sea, and is rarely met with about Colombo. It produces seed very scantily anywhere, a pod or two occasionally being all that can be obtained, and even these are often infertile. Propagation by layering has, therefore, to be adopted. Introduced into Ceylon in 1860. (H. F. MacMillan, Handbook of Tropical Gardening & Planting, p. 291.)

Annona marcgravii Martius. (Annonaceae.) 42988. Seeds from El Banco, Colombia. Presented by Mr. H. M. Curran. "*Guayacana del Monte*. Wild anona. Tree in second growth forest. Edible fruit, 6 inches in diameter. Greenish-white fruit, slightly acid." (Curran.)

Bactris sp. (Phoenicaceae.) 42855. Seeds of rattan palm from Bolivar, Colombia. Presented by Mr. H. M. Curran. "Outer coat of fruits edible. Bright red clusters of fruit very ornamental. Mountains of Magdalena, 1,000 feet elevation." (Curran.)

Beaumontia grandiflora (Roth) Wallich. (Apocynaceae.) 42971. Seeds from Dehra Dun, United Provinces, India. Presented by Mr. Thomas Tracy. "A mammoth creeper that has run up to the top of the cotton tree. The

blossoms are formed in a cluster; pure white and fragrant; corolla deep and unbroken. The corolla is about two inches deep with an undulating border." (Tracy.)

Berberis sargentiana Schneider. (Berberidaceae.) 42973. Cuttings from Jamaica Plain, Mass. Presented by Prof. C. S. Sargent, Arnold Arboretum. A black-berried barberry from western Hupeh, China, reaching a height of 2 meters. It is the only evergreen barberry which has proved entirely hardy at the Arnold Arboretum, and for this reason is one of the most desirable of the recent introductions as a garden plant. (Adapted from Plantae Wilsonianae, Vol. 1, p. 359, 1913.)

Britoa acida (Mart.) Berg. (Myrtaceae.) 42989. Seeds from Papayal, El Banco, Colombia. Presented by Mr. H. M. Curran. "*Guayabo.* Tree 20 to 30 feet. Large yellow fruit, few seeds, acid, 3 inches in diameter, flesh." (Curran.)

Buddleia globosa Hope. (Loganiaceae.) 42864. Seeds from Santiago, Chile. Presented by Senor Don Ernesto Palacios, Catholic University. The *panil* or *palguin*, a Chilean shrub better known as *matico*, owes its name *panil* to the soft fleshy consistency of its leaves, which are much used in curing inflammation and are used with good results for washing wounds. Abundant in Valdivia, where it occurs as a shrub, covered in November with yellow flowers, in globose clusters.

Chrysobalanus icaco L. (Rosaceae.) 43000. Seeds from Tierras de Loba, Bolivar, Colombia. Presented by Mr. H. M. Curran. "A shrub from four to eight feet in height, much branched. Planted more as an ornamental about the houses than for the fruit. Fruits white with a pinkish bloom, rather dry and insipid; about the size of a wild plum." (Curran.)

Cucumis melo L. (Cucurbitaceae.) 42840-42849. Seeds of ten varieties of melon from Petrograd, Russia. Presented by Miss M. I. Kurnakova Danilova, through the American Vice Consul, at the request of Dr. C. C. Young, Belen, Texas. Brief descriptions by Miss Danilova follow. 42840. "Red, soft-fleshed, aromatic, summer melon called *Ananas* (pineapple)." 42841. "Black summer melon called *Urlik*." 42842. "Sweet, aromatic, soft-fleshed winter melon called *Adan*." 42843. "Light green, summer melon called *Aramad*." 42844. "Local

batrin, length ¾ yard, thickness 3 inches." 42845. "Soft, juicy summer melon called *Daniar*. 42846. "Mixed summer melons of all kinds." 42847. "Summer melon called *Akurtsi*." 42848. "Sweet, juicy winter melon." 42849. "The Amir melon called *Maiskaja*."

Cucurbita ficifolia Bouche. (Cucurbitaceae.) 42970. Seeds from Santa Ines, Chile. Presented by Mr. Walter Fischer, Bureau of Commerce, who secured them from Sr. Salvador Izquierdo, Santiago, Chile. "The alcallota is a pumpkin-like vegetable, from the pulp of which is made a sweet paste, comparable perhaps to "pumpkin butter," sold in cans under the names of *Dulce de alcallota* and *Creme de alcallota*.

Fraxinus oxycarpa Willd. (Oleaceae.) 42838. Seeds of ash from Kieff, Russia. Presented by Messrs. St. Przedpelski & T. Antoniewicz. Similar in its leaves in shape, size and leaflets to *F. angustifolia* Vahl, but the leaves are always downy about the midrib. Fruits more tapered at the base. The species has a more eastern natural habitat, reaching to Persia, the Caucasus, and Asia Minor.

Hibiscadelphus giffardianus Rock. (Malvaceae.) 42879. Seeds of *Hau Kuahiwi* from Honolulu, Hawaii. Presented by Mr. J. F. Rock, Botanist, College of Hawaii. "You may know that of this species there is only one single tree in existence and consequently seed is very scarce. I have a number of young trees growing in Honolulu and thus hope to perpetuate the species." (Rock.) "The *Hau Kuahiwi* is a remarkable tree. At first appearance one would think it to be the common *Hau* (*Hibiscus tiliaceus*), but at closer inspection one cannot but wonder at the most peculiar shape of the flowers, which are of a deep magenta, and the large yellowish tuberculate capsules. It is a rather low tree with not erect but rather inclining trunk of a foot in diameter, with a many-branching round crown. The genus Hibiscadelphus, meaning brother of Hibiscus, was described by the author and the species named in honor of Mr. W. M. Giffard of Honolulu, in whose company the writer collected his first specimens. It differs from the genus Hibiscus in its very peculiar flowers and mainly in the calyx, which is not persistent with the capsules, but drops together with the bracts as soon as the capsules are formed. Unfortunately the tree, of which a specimen is figured

in this book, is the only one in existence. It is unique among all Hawaiian plants, and the author is sorry to relate that nothing has been done to protect it. Like many other Hawaiian trees, it will succumb to the ravages of cattle, which inhabit a great many of our native forests. This single tree is found on a small Kipuka of 56 acres called Puaulu, on the land of Keauhou, near Kilauea Volcano, at an elevation of 4,200 feet, on the Island of Hawaii. It is surrounded by a great many rare trees, which will share its fate sooner or later. Among them are beautiful trees of *Sapindus saponaria, Pelea, Xanthoxylum, Urera, Straussia, Ochrosia,* etc. The genus consists of three species, the above described one on Hawaii, one on Maui with only a single tree left, and the third on Hualalai, Hawaii." (J. F. Rock, Indigenous Trees of the Hawaiian Islands, p. 299.)

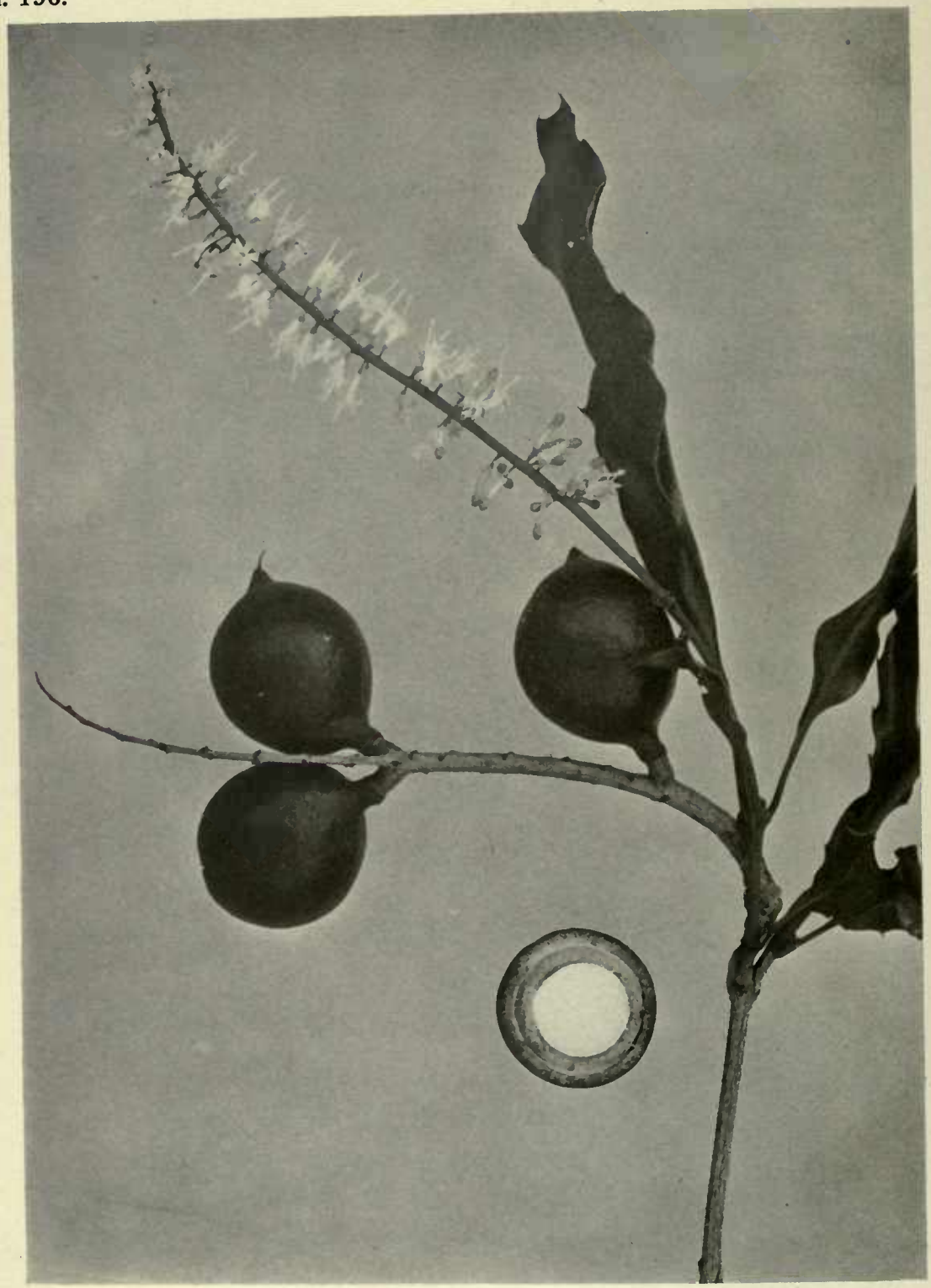
Licania platypus (Hemsl.) Fritsch. (Rosaceae.) 42991. Seeds from Papayal, El Banco, Colombia. Presented by Mr. H. M. Curran. "*Chupa.* Large fruits, with smooth brown or greenish coat. Soft yellow, rather dry flesh. Fruits 4 to 6 inches long, 2 to 3 inches in diameter. Tree 40 to 60 feet. Said to bear at all seasons." (Curran.)

Mangifera indica L. (Anacardiaceae.) 42992-42996. Seeds from Papayal, El Banco, Colombia. Presented by Mr. H. M. Curran, who furnished the following brief description. 42992. "*Mango Hobo.* Very large, very yellow, good flavor." 42993. "*Mango Liso.* Large, one of the earliest, ripe March to April, good flavor." 42994. "*Mango Chupa.* Large red." 42995. "*Mango Masa.* Yellow with dark lines." 42996. "*Mango Lechoso.* Commonest and best flavored of the mangoes in this region. Very large crop this year. Fruit medium sized, yellow, very much fiber."

Maytenus boaria Molina. (Celastraceae.) 42874. Seeds from Santiago, Chile. Presented by Senor Ernesto Palacios, Catholic University. This Chilean tree, known as *huripo* to the Araucanians attains 12 meters in height with slender trunk. It is undoubtedly the most beautiful native tree in its foliage, which trembles and waves in the slightest breeze. Its leaves, which have a great forage value, are most eagerly sought by hungry cattle, like those of the weeping willow. Its wood, which is often yellow, is

SMALL BEARING TREE OF THE MACADAMIA, MACADAMIA TERNIFOLIA, S. P. I. No. 21249.

The Macadamia, or Queensland nut, appears to be doing admirably in the rocky soil at the Miami Garden. The specimen shown in the photograph has flowered for the past three years and is now 8 years old from seed. Last year it produced a few nuts of good quality and is bearing again this year, and if its behavior so far can be taken as an indication, it deserves to be considered as a new and promising nut tree for Florida. Photographed (P19612FS) by P. H. Dorsett at Miami Field Station, June 12, 1916.



FLOWERS, LEAVES, AND FRUIT OF THE MACADAMIA, MACADAMIA TERNIFOLIA.

In Queensland this nut has become of commercial importance and orchards of it are being planted. No selection of varieties has yet been made, nor is it possible as yet to predict with regard to yields or diseases, but the fact that the tree will fruit in southern Florida makes it eligible for trial by a large number of experimenters. The fruits are borne in clusters, the shell is thick, and the edible portion is as easily removed as that of a filbert. In Plant Immigrants No. 78 is shown an illustration of the nuts. Photographed (P19721FS) by P. H. Dorsett at Miami, Fla., Field Station, June 14, 1916. Natural size.

hard and elastic. There are varieties the wood of which is finely streaked with red and olive.

Metrosideros spp. (Myrtaceae.) 42851-42852. Seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright, 42851. *M. robusta* A. Cunningham. "Native name *Rata.* This tree grows to over 100 feet high and 6 feet or more through, a hard wood, very durable; is largely used by wheelwrights. Found all over New Zealand. When in bloom is very gorgeous. *M. robusta* is only found inland in the forests and not on the coast. It is very difficult to gather seed, owing to the height it grows before seeding." (Wright.) 42852. *M. tomentosa* A. Richard. "Native name *Pohutukawa.* This is without doubt one of the most beautiful of flowering trees and is invaluable for bees, the honey from which is of excellent flavor and is as white as lard. This tree is to be found skirting the New Zealand coast, on the hill sides, along the sea beach, and even grows out of the sides of cliffs, overlooking the sea. In many cases you can see trees just above high water mark, where the roots are frequently washed by the tide, and doing well. Like *M. robusta* its wood is hard and is used for making knees for boat building; grows to about 40 feet high. Strange to say *M. tomentosa* is only found in the wild state growing near the sea, although it grows well inland providing it is protected from frost." (Wright.)

Pittosporum tenuifolium Gaertner. (Pittosporaceae.) 42853. Seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. "Hardy, used for hedges. Seed takes a very long time to germinate, often 12 months." (Wright.)

Rosa spp. (Rosaceae.) 42974-42982. Cuttings from Arnold Arboretum, Jamaica Plain, Mass. Presented by Professor C. S. Sargent. 42974. *R. banksiopsis* Baker. A very common rose in western Hupeh in thickets of low-growing shrubs on mountain slopes at altitudes from 1,300 to 2,000 meters. It grows to a height of 3 meters, has rose-red flowers, coral-red fruits, and more or less reddish-purple shoots and branches remarkably free from prickles. (Adapted from Plantae Wilsonianae, Vol. 2, p. 322, 1915.) 42975. *R. bella* Rehder & Wilson. "This pretty rose from mountains in north-western Shansi, seems most closely related to *R. moyesii* Hemsley & Wilson, which is a much more vigor-

ous plant with stout prickles, larger usually more acute leaflets pubescent beneath, at least on the midrib, globose-ovoid flowerbuds abruptly contracted at the apex, larger flowers and pinnate sepals. (Plantae Wilsonianae, Vol. 2, p. 342, 1915.) 42976. *R. caudata* Baker. "This is a rose discovered by Wilson in western China. It is a tall vigorous shrub with stout arching stems covered not very thickly with stout spines, dark green foliage, and flowers about two inches in diameter, in wide, sometimes twenty-five flowered clusters. The beauty of the flowers is increased by the white marking at the base of the pure pink petals. The fruit is orange-red, an inch long, gradually contracted above into a narrow neck crowned by the much enlarged calyx-lobes. This handsome rose is flowering now for the third year in the Arboretum; it is perfectly hardy and an excellent addition to the roses of its class. (Arnold Arboretum, Bulletin of Popular Information, new series, Vol. 1, p. 42, 1915.) 42977. *R. corymbulosa* Rolfe. "A distinct new species with unarmed or sparingly prickly branches and numerous flowers in corymb-like inflorescences. Flowers ¾ to 1 inch across. Petals broadly obcordate, deep rose above, white at the base. Fruits globose, glandular, about 1/3 inch long, crowned by the persistent sepals. Central China." (Kew Bulletin of Miscellaneous Information, New Garden Plants of the Year 1915, p. 80.) 42978. *R. davidi* Crepin. An orange-fruited, pink-flowered rose from western Szechuan, China, reaching a height of 5 meters at altitudes of 1,600 to 3,000 m. It is the species nearest in China to *R. macrophylla* Lindley of the western Himalaya. (Adapted from Sargent, Plantae Wilsonianae, Vol. 2, p. 322, 1915.) 42979. *R. helenae* Rehder & Wilson. "From the seeds of a rose collected by Wilson in western China a new species of the *Moschata* group has been raised. It is now flowering in the Arboretum for the third year and is to be named *R. helenae;* it is a vigorous and perfectly hardy shrub with slender, arching stems furnished sparingly with short red spines, and five or six feet high, light green cheerful foliage, and terminal and axillary many-flowered clusters of pure white, delicately fragrant flowers an inch and a half in diameter and borne on short erect branchlets. It is a plant which will be prized by persons realizing that among the wild roses are some of the most beautiful of all flowering plants and who find a place for them in their gardens." (Arnold Arboretum, Bulletin of Popular Information,

new series, Vol. 1, p. 39, 1915.) 42980. *R. jackii* Rehder. "This beautiful rose was introduced into the Arboretum from Korea several years ago by Mr. Jack, and when it flowered was named for him. At about the same time it was named in England *R. bakeri* and *R. kelleri*, names which cannot be used for it, however, as they had previously been given to other roses. It is one of the *Multiflorae* roses with long stems which lie flat on the ground, lustrous foliage, and pure white flowers two inches or more in diameter, in wide, many-flowered clusters. The flowers are larger than those of the Japanese *R. multiflora* and it blooms much later than that species. This rose is perfectly hardy and a first-rate garden plant. The hybridizer ought to be able to find it in a good subject from which to raise a race of hardy, late-flowering Rambler roses. (Arnold Arboretum, Bulletin of Popular Information, new series, Vol. 1, p. 43, 1915.) 42981. *R. multiflora cathayensis* Rehder & Wilson. "It is a hardy, vigorous, and handsome plant with the habit of the Japanese *R. multiflora*. The flowers are from two to two and a half inches in diameter and are produced in large, many-flowered clusters, and the large, conspicuous, bright yellow anthers add to the beauty of the clear pink petals. This rose may well become a popular garden plant. It offers possibilities which the hybridist will undoubtedly take advantage of; and it is of considerable historical interest as the wild original of garden plants cultivated probably for centuries by the Chinese and known in Europe and America for more than a hundred years." (Arnold Arboretum, Bulletin of Popular Information, new series, Vol. 1, p. 35, 1915.) 42982. *R. sweginzowii* Koehne. A rose from western Szechuan, with deep rose colored flowers, growing to a height of 5 meters, at altitudes of 2,300 to 3,600 meters. The shoots are thickly covered with short, stout, flattened prickles. (Adapted from Plantae Wilsonianae, Vol. 2, p. 324, 1915.)

Rymandra excelsa Salisbury. (Proteaceae.) 42850. Seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. "New Zealand honeysuckle tree, the wood of which is used for veneering purposes, in making furniture. Very pretty in the grain. Its flowers are pretty and at the same time odd, coming out of the side of the branches, instead of out of the terminals as in most cases. A pretty tree and a useful timber for furniture." (Wright.)

Strychnos spinosa Lam. (Loganiaceae.) 42903. Seeds from Beira, Mozambique, Portuguese East Africa. Presented by Mr. E. H. Heron, Director of Agriculture. "Vernacular name M'Tamba." (Heron.) A small tree up to 10 feet high found throughout Tropical Africa, in Madagascar, and the Seychelles. This tree is interesting because of its cannon-ball-shaped hard-shelled fruit, 2 to 3 inches in diameter, with acid pulp which is wholesome and agreeable with a clove-like aroma very noticeable when ripe. The seeds contain no alkaloid. This plant has produced fruit in Florida where it seems to do well.

Theobroma purpureum Pittier. (Sterculiaceae.) 42857. Seeds from Bolivar, Colombia. Presented by Mr. H. M. Curran. "*Cacao del Monte.* Wild cacao from Cauca River valley. Small tree in dense forest. Said to be edible." (Curran.)

Ximenia americana L. (Olacaceae.) 42896. Seeds of false sandalwood from Donga, Northern Nigeria, West Africa. Presented by Rev. C. L. Whitman, Sudan United Mission. "Seeds of what might be called an apricot-plum. A fruit the size of a small plum growing on a plum-like tree, but having considerable of an apricot flavor." (Whitman.)

Notes on Behavior of Previous Introductions.

Cicer arietinum. Garbanzo. The Garbanzo is now being cultivated rather extensively in some parts of the West. Mr. R. L. Beagles, Farm Superintendent in charge of the Chico Plant Introduction Field Station, writes that he saw in the neighborhood of Gridley, near Sacramento, Calif., a plantation of about fifty acres which looked very promising.

Diospyros kaki. (S.P.I. 16912, 16921, 26773.) Tamopan persimmon. This large and delicious variety is now on the market in Washington and is seemingly proving popular. Fruits are being grown for the market by J. C. Breese, Fayetteville, N. C., and H. H. Hume, Glen St. Mary, Fla.

Feijoa sellowiana. This Office has just received a consignment of these fruits from Mr. Hertrich, manager of the Huntington estate in Pasadena, Calif. It is a most promising myrtaceous fruit, and is likely to

be greatly increased in size by selection and prove hardy farther north than any other large fruit of this family. It has a granular pulp of peculiar flavor which may prove objectionable to some people at first, though many consider it a very delicious fruit. It is probable that a ready market will be found for selected strains of this relative of the guava.

Prunus serrulata. Japanese flowering cherry. Several varieties of the flowering cherry are proving to be striking in autumn foliage. The younger shoots are particularly beautiful and hold their leaves well into November in the vicinity of Washington. Particularly beautiful seem to be the *Ussussumi,* with masses of gorgeous bronze and green leaves; *Murasaki,* with its daintier pink and yellow; and *Yoshino* with a series of hues ranging from wine-red to bright yellow. The many other varieties are also valuable in bringing out masses of colors ranging from green, bronze and almost maroon to bright red, pink and yellow.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
G. P. Van Eseltine, Assistant, in charge of Label Catalogue, and Office Herbarium.
Nathan Menderson, Assistant, in charge of Chayote Investigations
David A. Bisset, Assistant in Plant Introduction.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 123. JULY, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Arachis	1025	Litchi	1027
Belou	1025	Osterdamia	1027
Buchanania	1025	Paeonia	1027
Canarium	1025	Prunus	1028
Clerodendrum	1026	Rubia	1028
Iris	1026	Ulmus	1028
Juglans	1026		

Plates:

Pl. 197. Planting of Siberian Larch in Canada, *Larix sibirica.*

198. Flowering deciduous branchlets of the Jujube, *Ziziphus jujuba.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

February 6, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Arachis hypogaea L. (Fabaceae.) 43035. Seed from Buitenzorg, Java. Presented by Mr. L. Koch, Station for Selection of Annual Crops. "Pure strain No. 21. Is almost not affected by severe disease, known here under the name of bacterial-disease. Cultivated at the Plant Breeding Station for Annual Crops." (Koch.)

Belou marmelos (L.) Lyons. (Rutaceae.) 43028. Seed from Rangoon, Burma, India. Presented by Rev. Wm. H. S. Hascall. "Season for fruit, March and April." (Hascall.)

Buchanania latifolia Roxb. (Anacardiaceae.) 43038. Seed from Burma, India. Presented by the Superintendent, Royal Botanic Garden, Sibpur, Calcutta, India. "A medium-sized tree, leafless only for a short time, met with in the dry forests throughout India and Burma, ascending in the Sub-Himalayan tract to 3000 feet. A pellucid gum (peal or pial) which exudes from wounds in the stem is more than half soluble in water. It is said to resemble Bassora gum, to have adhesive properties like inferior gum arabic and to be suitable for dressing textiles. The bark and the fruits furnish a natural varnish. The kernels yield a sweet and wholesome oil (chironji), but owing to their being much prized as a sweetmeat when cooked, the oil is seldom expressed. The kernels, which have a flavour something between that of the pistachio and the almond, are eaten by the natives. In the hills of Central India the fruits with the kernels are pounded and dried and subsequently baked into a sort of bread. From the Panjab and Bombay the leaves are reported as used for fodder. The timber is not very hard nor durable and is of small value, though made into spoons, plates, toys and bedsteads, and is even employed for door and window frames, plough-handles, etc." (Watt, Commercial Products of India, p. 188.)

Canarium indicum Stickman. (Balsameaceae.) 43024. Seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Gardens. "Java-almond. A large handsome Malayan tree, characterised by a remarkable buttressed trunk and latterly compressed aerial basal roots; the latter develop enormous erect flanges of uniform thickness, so that solid circular pieces may occasionally be cut out from them to form ready-made cart wheels. The tree is much cultivated for shade or ornamental in Java. It bears

in great abundance large pendant clusters of dark-purple fruits, which are the size of small plums; these are produced all the year around, but chiefly in June. The kernel of the fruit is edible, being similar in flavour to sweet almonds; it yields by expression an oil used for burning in lamps and for cooking purposes. A desirable tree for planting in avenues, etc. It thrives in hot and moist districts up to about 1500 feet elevation, and prefers deep, well-drained soil. Propagated by seed, which may be sown in nursery beds and kept moist and shaded until germinated." (H. F. Macmillan, Handbook of Tropical Gardening and Planting, p. 146.) Dr. Valeton of Buitenzorg discovered that a very palatable milk could be made from the kernels of this Canarium nut which formed an excellent substitute for mother's milk and that babies could be raised on it successfully.

Clerodendrum cyrtophyllum Turcz. (Verbenaceae.) 43021. Seeds from Mokanshan, Chekiang, China. Collected by Mr. Frank N. Meyer, Agricultural Explorer of this Department. "A spreading shrub, from 2 to 5 feet high, sending up many stalks; found on debris on mountain slopes at 1200 to 2000 feet altitude. Leaves glabrous, opposite, light-green, of somewhat fetid odor. Flowers small, white but with large bracts of rosy color, berries blue. Ornamental but somewhat weedy. Of use for large parks and estates in mild climates as a cover shrub for sandy and waste places." (Meyer.)

Iris sp. (Iridaceae.) 43022. Seed from Mokanshan, Chekiang, China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "An Iris, forming big clumps, found in a garden but said to occur wild in mountain ravines. Flowers reputed to be purplish." (Meyer.)

Juglans insularis Grisebach. (Juglandaceae.) 43032. Seeds from Santiago de las Vegas, Cuba. Presented by Mr. Juan T. Roig, Agricultural Experiment Station. "Cuban native walnut, collected at Trinidad Station, Clara Province." (Roig.) "This interesting Cuban tree has recently been called to the attention of horticulturists by Van Hermann and Roig. It is found in the mountainous sections of the island, sometimes at considerable elevations. I have seen it in the mountains near Trinidad, on the south coast, at an elevation of about 2000 feet, growing among numerous other trees

PLANTING OF SIBERIAN LARCH IN CANADA, LARIX SIBIRICA.

At Indian Head, Alberta, where the temperature goes to at least 50 degrees below zero, Mr. N. M. Ross, Superintendent of the Forestry Station of the Dominion Government, has a plantation of this rapidly growing Siberian larch, which is now 8 years old. Its rapid growth and hardiness made it seem to be an unusually promising tree for the forest belts of the plains region of Canada, but unfortunately a bud moth has become established in the plantation and has interfered with its progress. In regions in this country free from this pest it deserves to be further experimented with. In Plant Immigrants No. 72 is shown a photograph of a large tree of this species in Siberia. Photograph, courtesy of Mr. N. M. Ross.

FLOWERING DECIDUOUS BRANCHLETS OF THE JUJUBE, ZIZIPHUS JUJUBA.

Unlike most fruit trees, but more like the grapevine, the jujube bears its flowers and fruit o slender branches which are produced each spring. These look like compound leaves, but are tru branches. In autumn the leaves fall first and leave the bare slender branchlets, which subsequentl drop of themselves. It remains to be determined what bearing this characteristic has on th relation of the fruiting of the jujube to late spring frosts. Photographed (P19661FS) by P. H Dorsett, Chico Field Station, May 17, 1916. Natural size.

along the bank of a small stream. It seems, however, to be comparatively rare, and does not occur in great numbers. It is erect and slender in habit, growing to a height of 40 or more feet, with foliage somewhat finer than *J. nigra* of the United States. The nuts resemble those of *J. nigra* in size and appearance, though sometimes smaller. The kernels, however, are removed with difficulty, the septae being very thick and woody. In its present wild state the Cuban walnut, as it is called, does not seem of great horticultural value, but with very little improvement by selection it seems that it might become an excellent nut for tropical regions. It has been suggested that it might serve as a stock for the Persian walnut, making possible the culture of this species in Cuba and other tropical regions where it is not now successfully grown. For illustrations of the tree and fruit see Journal of Heredity, December, 1915." (Wilson Popenoe.)

Litchi chinensis Sonnerat. (Sapindaceae.) 43034. Seeds from Swatow, China. Presented by Mr. G. C. Hanson, American Consul. "This fruit is placed on the market at the beginning of summer, and can only be obtained during a very short period. The Swatow litchi has the reputation of not being as good as the Canton variety, which also matures early in the summer. Grown in the neighborhood of Chaochowfu." (Hanson.)

Osterdamia matrella (L.) Kuntze. (Poaceae.) 43023. Seed from Yokohama, Japan. Purchased from the Yokohama Nursery Company. A creeping grass, important for binding coast-sands, which does well on alkali soils, and also as a lawn-grass. Said to be relished by stock.

Paeonia brownii x albiflora. (Ranunculaceae.) 43015. Seeds from Los Angeles, Calif. Presented by Mr. P. D. Barnhart. "From our native paeonia which are the products of flowers that I pollinated with pollen of the Chinese type, such as you grow in the East. I got the material of the Henry A. Dreer people last year. They collected it from white varieties in their great field. I hope to get a cross that will bear large flowers, and plants that are adapted to this climate. Our hills are covered with them, but the flowers are small and inconspicuous, though they begin to bloom, and profusely too, in early February and continue into March. This year the first flowers appeared in January, and those that I worked failed to set seed. I used heavy paper sacks to protect the subjects from rain and insects." (Barnhart.)

Prunus bokhariensis Royle. (Amygdalaceae.) 43039-43048. Seeds of ten varieties of plums from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanic Gardens.

Rubia tinctorum L. (Rubiaceae.) 43037. Seed from Paris, France. Procured from Vilmorin-Andrieux & Company. "The root of *Rubia tinctorum* furnishes dyer's madder. The plant is a native of the south of Europe, and is extensively cultivated about Avignon and in Alsace for the roots, which afford the fine scarlet dye so highly valued by dyers and calico printers. A great quantity is grown in the Levant, the north of Africa, and in Holland; but that from Africa and the East, particularly that from Cyprus, is the most esteemed. Several attempts have been made to cultivate it in England, but without profitable success. The roots are dug up the third summer after sowing, and having been deprived of their cuticle, are dried by artificial heat, and then reduced to a powder. Madder has a bitter, astringent taste, and imparts these properties to water and alcohol." (Hogg's Vegetable Kingdom, p. 415.)

Ulmus densa Litvinov. (Ulmaceae.) 43031. Seed from Kieff, Russia. Purchased from Messrs. St. Przedpelski & T. Antoniewicz. "An elm of most remarkable dense growth, sprouting out a little distance above the ground, into a number of stems, which form an umbrella-like head of foliage, which is so dense that it remains always twilight even at bright noon, in an avenue of these trees. This elm loves, apparently, a climate with long hot summers and with winters not too cold. Withstands a fair amount of alkali in the soil and in the irrigation water, and will prove of special value as a shade tree in the hot and dry interior valleys of California, Arizona, Texas and New Mexico." (Frank N. Meyer.)

Notes on Behavior of Previous Introductions.

Prof. C. C. Georgeson, in charge of the Sitka, Agricultural Experiment Stations, writes Oct. 10, 1916. Alaska,

"Your letter of Sept. 19th asks for information concerning the yellow flowered species and varieties of alfalfa, which we are growing at our interior stations, and which were presumably introduced by Professor Hansen, on his several collection trips.

Of the many varieties we have tried, there is one that stands out pre-eminently as the most successful, for the reason (1) that it is thoroughly hardy, having withstood temperatures of 66 to 70 degrees below zero, and (2) it produces seed at our Rampart Station, in latitude 65° 30', which is an equally important point, inasmuch as we should be unable to propagate it in a practical way, unless we could raise the seed. I have looked up the source of this hardy variety. It was transmitted to me by you in your letter of May 13, 1910. The S. P. I. number is No. 24452, but *Medicago falcata* is the most valuable plant for Alaska that has ever been introduced from any source. It grows freely, the leaves are small but thick on the stem, the stems are in most plants procumbent and they will grow from two to four feet in length. They bloom early and seed freely. The blossoms continue to come until frost. It has one fault: The ripe pods split open very readily and shatter the seed in the process of handling. To save the seed, which I regard as very precious, we, therefore, pick it by hand to a large extent. We have hybrids between this species and *M. sativa*, variety Grimm, which promise to be of still greater value. The Grimm has a spiral pod; *falcata* has a nearly straight pod. Some of the hybrids have curved, or even spiral pods which do not split open readily and the seed does, therefore, not shatter in handling. I find that there is very great variation between individual plants as to habit of growth, size, abundance of leaves, seed production, etc., and in order to select the best types and eventually propagate from them only, we grow these valuable alfalfas as individual plants in rows two by three feet apart. This enables us to study individuals and select seed from those that possess the most valuable qualities. This process will be continued for a few years longer until an upright, vigorous, leafy, seed-bearing strain has been isolated. Altogether we have now some three acres at the Rampart Station, in these alfalfas, two acres of which were seeded last spring. *Medicago falcata* will be of untold value to interior Alaska. The problem now is to produce enough seed so that before long we can begin to distribute it in minute quantities to farmers who will appreciate its value. A word concerning Grimm: It is an excellent variety, and some years it does well, withstanding two or three winters, but each spring we find that a number of plants have winter killed, and

in the spring of 1915, nearly all of our Grimm alfalfa plants proved to be dead. I will say that I have, on several occasions, purchased both plants and seeds from Professor Hansen, of the South Dakota Experiment Station. He has a number of varieties: *Omsk, Obb, Gobi Desert, Semipalatinsk, Cherno,* etc., but for some reason, none of them are as valuable as the pure *falcata* at the Fairbanks Station. It was in full bloom the latter part of August, when I visited the station, but it produced no seed. Some pods had formed but they would have no chance of ripening.

I have told you frequently in former letters, that the *Petrowski* turnip, S. P. I. No. 22755, also obtained from the Office of Seed and Plant Introduction, is the most valuable turnip introduced into Alaska. Last year, we grew 240 pounds of seed of this variety at the Fairbanks Station and this year, between 1200 and 1500 pounds of seed from selected roots, and I learn that many small farmers in various sections grow seed of this variety for their own use."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
H. Klopfer, Plant Propagator.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago. Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 124. AUGUST, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Ananas	1033	Owenia	1035
Astrocaryum	1033	Passiflora	1036
Bertholletia	1033	Prunus	1036
Bulnesia	1034	Pterocarpus	1036
Citrus	1034	Raphanus	1036
Coffea	1034	Rubus	1036
Eriobotrya	1034	Tumion	1037
Hydnocarpus	1034	Urena	1038
Malus	1035	Vicia	1038
Mangifera	1035	Zea	1038

Plates:

Pl. 199. A trellis of young chayote vines in Florida, *Chayota edulis.*

200. Grove of Balsam Poplars in the Wu Tai mountains of China, *Populus suaveolens.*

201. An old Lombardy Poplar in Chinese Turkestan, *Populus italica.*

202. A rare avenue Poplar from China, *Populus simonii f. fastigiata.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

February 13, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Ananas sativus Schult. f. (Bromeliaceae.) 43070. from Lawnton, Queensland, Australia. Presented by Mr. Reginald W. Peters, Director, Queensland Acclimatisation Society. "A seedling pineapple we raised and have named *Commonwealth*. It is distinct, of fair size and very tender, with almost entire absence of stalk or core. It is sweet and perhaps lacking a little in sub-acidity but a fruit most consumers would enjoy." (Leslie Gordon Corrie.)

Astrocaryum sp. (Phoenicaceae.) 43058. Seeds from Tierras de Loba, Bolivar, Colombia. Collected by Mr. H. M. Curran. "*Palma estera*. Common palm of the forest. Seeds with an edible coating and probably yields a commercial oil. Plants with huge ornamental fronds, twenty feet or more in length, glossy green above, glossy or silvery white beneath. Entire plant covered with sharp black spines. This palm has practically no stem. Suitable only for planting in moist localities or greenhouses." (Curran.)

Bertholletia nobilis Miers. (Lecythidaceae.) 43114. Fruits and seed from Para, Brazil. Secured through Mr. George H. Pickerell, American Consul. "*Brazil-nut* or *Para-nut*. A tall handsome tree, with oblong wavy leaves, which are 14 to 16 inches long and about 3 inches broad, native of Guiana, Venezuela and Brazil. In its native home, especially on the banks of the Amazon and Orinoco, the tree attains a height of over 100 feet. The tree has been introduced at Paradeniya in 1880, and notwithstanding the indifferent ground chosen for it when first planted out, appears to find here a congenial home. It is now about 60 feet high and produces at the top each year, in the dry season, large erect racemes of white flowers, followed a few months later by a number of large brown fruits, which hang on the tree for some months after ripening. Ridley records similar success with the tree at Singapore, where it was introduced in 1881. Each fruit is from 4 to 6 inches in diameter, with a hard brown woody shell which has to be sawed or broken up with an axe in order to obtain the nuts (seeds). In the interior, closely packed, are from 10 to 12 large angular seeds with a brown horny testa; these are the *Brazil nuts* of commerce, which form an important article of export from their native country, being largely used for dessert in Europe, America, etc. The tree may be propagated by seed or gootee (layering), and

thrives best on a rich alluvial soil, in hot and moist climate." (Macmillan, A Handbook of Tropical Gardening and Planting, p. 144, under *Bertholletia excelsa.*)

Bulnesia arborea (Jacq.) Engler. (Zygophyllaceae.) 43057. Seed from Calamar, Colombia. Collected by Mr. H. M. Curran. "*Guayacan.* One of the principal trees of this region, 60 to 70 feet high, 24 inches in diameter, wood hard, durable. Flowers yellow. Used for railroad ties, are not expensive and weathers well. Magdalena river above Calamar, March 25, 1916." (Curran.)

Citrus sinensis (L.) Osbeck. Plant from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery. "*Best's seedless.* A new local seedling of great merit, and, as its name indicates, perfectly seedless; in quality one of the finest we have ever sampled, and sure to become a great favorite; the most vigorous of all oranges." (Avondale Nursery Catalogue.)

Coffea amara F. F. Bruijning. (Rubiaceae.) 43073. Seed from Fort Dauphin, Madagascar. Presented by Mr. G. Regnard, Port Louis, Mauritius. "Local name *Mautsaka.* French name *Cafe Marchal.* Without caffeine." (Regnard.) Mr. Wm. B. Harris, of the United States Department of Agriculture, reports as follows on the physical analysis of this coffee: "I have examined the caffein-free coffee of Madagascar.---The liquor from both the medium and the dark roast is exceedingly bitter, similar to the bitter taste from an orange seed or the bitter of quinine. With this character, in my opinion, it is worthless for trade purposes, whether it contains caffein or not."

Eriobotrya japonica (Thunb.) Lindl. (Malaceae.) 42148. Plant from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery. "*Thames Prize.* Named so from the fact that it has always carried off the prize at the Thames Show, the district of its origin; fruit of large size and very fleshy. Tree very vigorous." (Avondale Nursery Catalogue.)

Hydnocarpus kurzii (King) Warburg. (Flacourtiaceae.) 43227. Seed from Calcutta, India. Purchased from Messrs. Smith, Stanistreet & Co., through Mr. James A. Smith, American Consul-General. "A large tree, 40 to 50 feet high, of the forests of Sylhet, Chittagong

and Burma. The seeds yield the true chaulmugra oil, long supposed to be the product of *Gynocardia odorata*. Chaulmugra oil has long been known and used in India as a remedy for cutaneous diseases, and has become a drug of some importance in European practice. The seeds are bought to Calcutta, chiefly from Chittagong, and are of two kinds (1) mature seeds with brown kernels, rich in oil; (2) immature seeds with black kernels, poorer in oil. The seeds arrive in the market at the end of the rainy season in November and December. To extract the oil the kernels are separated from the shells and dried in the sun. They are then pounded with a pestle and mortar and the broken kernels put into canvas bags and the oil expressed with the aid of fire in a castor-oil mill. The oil is of two kinds (1) clear, bright, straw-coloured; (2) muddy and precipitating a sediment of earthy colour. One maund of oil is obtained from 4 to 5 maunds of seed." (Extract from Watt's Commercial Products of India.) Authentic cures are reported from the use of this oil in the treatment of leprosy and its employment has greatly relieved the suffering of those afflicted by this terrible disease. (Fairchild.)

Malus sylvestris Miller. (Malaceae.) 43151-43174. Plants of twenty-four varieties of apple from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery.

Mangifera indica L. (Anacardiaceae.) 43224-43226. Seeds of the mango from Mexico. Presented by Mr. W. Moore, British Vice Consul, La Paz, B. C. Mexico. Acting on the advice of the American Consul at Mazatlan, Mexico, the Department of Agriculture requested the Navy Department to instruct a vessel to call at La Paz, Lower California, Mexico, to obtain seeds of the various varieties of mangoes grown in that district, said to be very good. Accordingly, the U. S. S. Brutus stopped at this port, and with the cooperation of the British Vice Consul, Mr. Frank W. Moore, a box of seeds was obtained.

Owenia venosa Mueller. (Meliaceae.) 43071. Seed from South Yarra, Melbourne, Australia. Presented by Mr. J. Cronin, Curator, Melbourne Botanic Gardens. An Australian tree reaching a height of 40 feet with a diameter of 3 feet. A native beverage is made from the sour fruit, and the durable easily worked wood

which is of great strength and highly colored in various shades from yellow to black is used for cabinet work although its excessive weight and hardness are against its common use. (Adapted from Maiden, Useful Native Plants of Australia.)

Passiflora lutea L. (Passifloraceae.) 43115. Seed from Augusta, Georgia. Presented by the P. J. Berckmans Company. The ordinary yellow passion-flower of the south, climbing or trailing to a height of 10 feet. Flowers greenish-yellow, nearly an inch across, berries half an inch in diameter, smooth, deep purple, not edible. This vine occurs native as far north as Pennsylvania and Illinois, and it is quite probable that hardy hybrids with some of the edible Passifloras may be secured by crossing.

Prunus nigra Aiton. (Amygdalaceae.) 43076-43112-43202-43212. Cuttings from Canada. Secured by Prof. M. J. Dorsey, University of Minnesota, St. Paul. "Scions from the most promising of the W. D. Buchanen seedlings, growing in the orchard at the Manitoba Agricultural College. These were selected for their promise from the large collection of Mr. Buchanen and represent the best wild types found in the range of the species in Canada. No records are available as to their exact place of origin." (Dorsey.)

Prunus salicina Lindley. (Amygdalaceae.) 43175-43182. Plants of eight varieties of Japanese plums from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery.

Pterocarpus marsupium Roxburgh. (Fabaceae.) 43189. Seed from Dindigul, Madura District, South India. Presented by Mr. W. P. Elwood. "*Vengai.* A tree with beautiful, hard wood. The tree grows at an elevation of from 3000 to 4000 feet and endures a good deal of heat and drought. A great many of the seeds are destroyed by worms and other insects entering the seed vessel at the side." (Elwood.)

Raphanus sativus L. (Brassicaceae.) 43061-43069. Seed of nine varieties of radish from Yokohama, Japan. Purchased from the Yokohama Nursery Company.

Rubus strigosus Michx. (Rosaceae.) 43195-43201. Seed from Canada. Collected by Mr. M. J. Dorsey, University

of Minnesota. "Raspberries carefully selected from plants bearing berries of the best type for the species in the regions around Lake Winnipeg and the Riding Mountains in Canada for the purpose of securing the wild raspberry for breeding purposes in the northern United States. This species grows abundantly and is generally distributed in the localities visited in Manitoba. It is quite similar in appearance in its northern range to that of the northern part of Minnesota where I have had the opportunity to observe it quite extensively in the wilds, especially in the region of the Red Lakes, Grand Rapids, Cloquet, Mille Lac, etc. It seemed from the preliminary survey of the field that it would be best to visit localities on the edge of the granite area extending in a northerly direction about sixty miles east of Winnipeg, as well as the region of the Riding Mountains. The granite area was visited at points around Lac du Bonnet, the Winnipeg River and the Pinawa River. From these points on the margin of the granite area in the east I proceeded to the west from Winnipeg to the Riding Mountains. Here *R. strigosus* grew generally along ditches and roads and in the burned-over areas of the foothills. In the eastern region the raspberries were on the whole bearing more abundantly than those in the west at the Riding Mountains. The isothermal lines extend considerably northward in this region so it seems to me from the progress of the season and the nature of the vegetation that perhaps all told the selections in the east on the granite area were made from stock subjected to harder weather conditions than in the west. Of course, in this part of Canada when winter sets in it is quite constant, and there is generally snow enough to cover raspberries growing in the wild. For this reason there may be an extension of the species northward owing to its natural protection rather than its ability to withstand cold." (Dorsey's report on trip Aug. 14, 1916.)

Tumion nuciferum (L.) Greene. (Taxaceae.) 43075. Seeds from Hankow, China. Procured through the American Consul General. "*Fei Tzu.* Occurs in the southern islands of Japan and in the forests of southern and central Hondo, attaining its greatest development on the river Kisagawa, 'rising to a height of 80 feet, and forming a tree unequalled in the massiveness of its appearance and in the beauty of its bright red bark and lustrous dark green, almost black foliage.' On

the southwest coast of Hondo where it is associated with Camellia, *Diospyros kaki*, and other garden favorites, it is somewhat different from the inland tree; the head is more dense and with a rounded top, not unlike that of some of the older Yews in this country; the leaves too are shorter, narrower and more pointed. The wood is strong and straight-grained; it is much valued for building and cabinet-making." (Veitch's Manual of Coniferae, 2d ed. p. 119, under *Torreya nucifera.*)

Urena lobata L. (Malvaceae.) 43074. Seed from Santiago de las Vegas, Cuba. Presented by Mr. Juan T. Roig, Botanist, Agricultural Experiment Station. "The most promising native fiber plant, known as *Malva blanca.* Is considered a good substitute for jute." (Roig.)

Vicia faba L. (Fabaceae.) 43228. Seed from La Paz, Bolivia. Presented by Mr. John D. O'Rear, United States Minister. "The only variety of horse bean that is cultivated in this country. The bean is produced very successfully in this country, especially in the high altitudes, and constitutes one of the principal articles of diet of the Indians of the Altiplano, who use it in roasted form. It is also used widely as table food, it being of very good quality, and when properly prepared provides a very wholesome and delicious dish. These seeds are dried in the same form as used by the natives for preserving the seed from one season to another, and will have to be soaked in water for two or three days before planting." (O'Rear.)

Zea mays L. (Poaceae.) 43117-43118. Seed of two varieties of corn from Ottawa, Canada. Presented by Mr. J. H. Grisdale, Director, Central Experiment Farm. Mr. A. J. Logsdail, of the Central Experimental Farm, Ottawa, Canada, writes as follows: "We are forwarding to you samples of Early Malcolm sweet corn, and some of its progeny produced here at the Central Experiment Farm. The Malcolm corn, in each instance, was the pollen parent of these crosses; the strains of early Ottawa were produced by employing Early Adams as the female parent, and the Squaw strains (have not been named as is evident) were produced by using our native Squaw corn, a dwarf, early maturing type of flint corn. We have found that this seed does best in areas where the average length and development of the season is similar to our conditions around Ottawa."

A TRELLIS OF YOUNG CHAYOTE VINES IN FLORIDA, CHAYOTA EDULIS.

The chayote vine is so vigorous that it requires an arbor or high trellis for its successful culture. This photograph taken on June 5 shows the vines after they are well started. Before October they will completely cover the arbor. Their unique fruits are borne mainly on the inside or shady side of the arbor. Although chayote arbors are seen frequently in the West Indies, South America, and Madeira, and small private plantings of this vegetable have been maintained near New Orleans for many years, its excellent qualities are quite as unknown to the general public as though it had never been introduced. Two acres of it are now growing at the Brooksville Garden. Photograph (P19679FS) taken by P. H. Dorsett at Brooksville Field Station, June 5, 1916.

GROVE OF BALSAM POPLARS IN THE WU TAI MOUNTAINS OF CHINA. POPULUS SUAVEOLENS, S. P. I. No. 22861.

This species, which is a native of Siberia and China, is used extensively by the Chinese for planting at the mouths of ravines to bind the stones and sand and prevent the mountain torrents from carrying their débris down over the cultivated fields below. It grows successfully at elevations of 8,000 feet. It is a white-barked species and its leaves when young have a balsamic odor. It may find a use in America similar to that made of it in China. Photographed (P5417FS) by F. N. Meyer, Wutaishan, Shansi, China, February 27, 1908.

AN OLD LOMBARDY POPLAR IN CHINESE TURKESTAN.

This old specimen of the so-called Lombardy poplar, *Populus italica*, is said to be 125 years old. It stands at the edge of a pond at Bas-Lengar, Chinese Turkestan. To Mr. Meyer it seems very likely that these so-called Lombardy poplars originated in central Asia, for one finds them in such numbers and in such out-of-the-way places and of such ages that it appears most unlikely that they should have been brought in from southern or western Europe. Photographed (P5636FS) by Frank N. Meyer at Bas-Lengar, Chinese Turkestan, December 7, 1910.

A RARE AVENUE POPLAR FROM CHINA. POPULUS SIMONII F. FASTIGIATA, S. P. I. No. 22363.

The typical form of this species of poplar is a very desirable perfectly hardy tree for the colder sections of the United States. This slender pyramidal form discovered by Meyer at Shiling in the Chihli Province of China, appears to have unusual promise as an avenue tree or in situations where the Lombardy poplar has been heretofore used. On the estate of Mr. Cyrus McCormick, at Lake Forest, Ill., a row of young trees has remained so far resistant to the poplar borer and its behavior there has led to its trial in the Chicago parks. There is a legitimate use for the pyramidal poplar, though it too often crowds out more precious trees. Photographed (P5412FS) by Frank N. Meyer, at Shiling, Chihli Province, China, January 25, 1908.

Notes from Correspondents abroad.

Mr. Meyer in a communication from Japan, says: "These last days I have been making inquiries into the peppermint-situation, but on the whole with negative results. You may remember you asked me for peppermint roots for Dr. Stockberger. Well I first saw the American Vice-Consul about the roots, that they sent in 1911, (No. 32167); he did not know, but he sent for the gardener from whom they had obtained them. This man first sent his wife, because it was rainy weather yesterday, but in the afternoon he showed up himself. He said there were three kinds grown in this part of Japan and the kind he obtained for the Consul was the best. He said that to go to the peppermint farms and to come back again would take two days. He did not know varietal names at all and proved to be quite useless for giving further information. I then went to the Kobe Foreign Board of Trade for information, but there I couldn't get anything beyond the intelligence that the peppermint-oil from Hokkaido is considered better than the local product. Then I visited the firm of McKay & Co., a firm exporting mint-oil, several times and met a Japanese who is dealing in mint-oil. This man told me that there is only one variety of mint and that the quality of the oil depends upon the care that is bestowed in the process of getting the oil out of the leaves. The mint is simply called 'Hakka' and he had never heard of varieties. Mint farms exist in the vicinity of Okayama, ¾ hrs. by train to the west of Kobe. I then saw a specialist in the great firm of Suzuki & Co., wholesale dealers in oils and drugs and this gentlemen told me there is only one variety grown in Japan, but since they have three crops a year and since the product of these crops varies considerably, people might think that there are several kinds of peppermint, but this is not so. Well, I had to give it up. Had I had more time at my disposal I would have visited the farms, but as my boat leaves for China tomorrow morning, I cannot do so. This, however is a nice piece of work to do for a young fellow who wants to train himself into an efficient agricultural explorer. I hope to retire from this work after some years and a young healthy and intelligent fellow ought to continue this work in Asia. One thing I would suggest to Dr. Stockberger, viz.: if there are varieties of peppermint and if these varieties indi-

vidually differ why not do as in sugar beets and in sugarcane and collect seeds and sow them out, testing each individual plant by itself! Perhaps some better types will be envolved than we possess now! In the American Consulate I saw a report on peppermint from the hand of Consul Hunter Sharp, addressed to the Asst. Secretary of State, dated Kobe, Japan, Nov. 23, 1906. Dr. Stockberger might be interested in obtaining a copy of it, if he has not got it already.

Mr. Frank N. Meyer writes from Yokohama, Japan, October 20, 1916, as follows: Among my notes I found a short scribble from you in blue pencil: Meyer to investigate Momme pickle industry of Japan. Yesterday afternoon I asked Mr. Watase about this and he gave me the following description: pick fruits when full grown but before they are quite ripe; they must be still hard; soak in a tub with water for 24 hours; drain off water, take salt and mix 1/3 salt to 2/3 fruits in quantity, mixed that way let them stand for a period from 5-7 days. Should the weather be cool 7 days will make them right; should it be warm 5 days is enough. Leaves of the red-leaved variety of *Perilla nankinensis* should be mixed among them. After this salting process the fruits are taken out and spread out in the sun to dry, then the juice of the salted red perilla-beans is sprinkled over them by squeezing a hand full of them and the fruits turned over. Every day this process is repeated and after 3 to 5 days they are put up in vessels in moderately weak brine, perilla leaves mixed among them and in this way the product can be kept almost indefinitely. Mr. Watase was shown fruits said to be 100 years old. Mr. Watase and I when we were talking about it both got the water freely flowing in our mouths. 'Yes,' Mr. Watase said, 'our famous deceased General Nogi used to say to his soldiers on a hot day in the Manchurian campaign, when there was no water in sight, "Boys, how would you like to have now some nice pickled mumes?"- and nobody after that complained about thirst.' I hope this recipe may be of use to you. By the way, if you go to the Nanking restaurant on 9th St., you can get there some very fine preserved mume fruits; they are called 'Ching mae' and are a high class delicacy in old Cathay."

Mr. Wilson Popenoe writes from Guatemala City Nov. 8, 1916: "As to early maturing varieties of the chayote; I presume you mean by this those which will come into fruit within a few months from planting. Apparently they have chayotes here all the year round, and consequently it is hard to tell which are the early and which are the late varieties, but I will look into the matter and see what I can find out. It is hard to get real information on such a subject, but by watching for plants in the gardens as I go round, I can probably get some ideas as to the habits of the different varieties. I am glad you liked the large white *perulero.* This still looks to me like the best variety here, and I have asked several of the natives about it, and they have expressed the same opinion. It is rare, and I have seen none of the fruit in the market since I bought the last lot I sent you. There is no end to the varieties of the chayote here, but the choice varieties are very few. I must say, although I do it with hesitation, that my appetite for chayotes is on the wane. This is no reflection on the chayote, which is a meritorious vegetable per se, but we get them every day, and nearly always cooked in the same way,-just boiled and served without anything on them. I want to tell you, however, that you Americans are making a great mistake in not familiarizing yourselves with the *ichinta.* No, this is not a new vegetable, it is merely the root of the chayote, and I believe it is just about as good as the chayote itself. It reminds me greatly of sweet cassava, which we used to get in Brazil. It is starchy, and not unlike an Irish potato in texture and appearance. They cut it in slices and fry it in batter, and it is good. In the markets here it is extremely common. I have also eaten the tender shoots of the chayote,- I did not know what I was eating until I had finished,-and they are not bad, but I do not consider them any improve ment over the various kinds of greens we already have in the states. I believe that large white *perulero,* if grown under good culture, would be a cracking good chayote, and I hope it will be given a thorough trial. As yet I have not hunted for any chayote diseases, but the vines I have seen have seemed to be healthy, and I have noticed nothing which seemed to be interfering with their growth seriously. No doubt there are diseases, but so far I have run across nothing which seemed to be wiping out the vines. You expect to find a disease,. or several of

them, on everything in the tropics, and you are rarely disappointed, though it is surprising how little harm many of them do down here. The trouble is, they might not be so harmless in another climate, and in any event, we don't want to try them to find out. That red-fleshed papaya was a surprise to me. I am generally skeptical about red-fleshed fruits, the term 'red' is so commonly used for brown that you can't trust it, but I am willing to say that the papaya I sent in has a very decided reddish tint, and the flesh is deep reddish salmon in color, quite distinct from the color of the varieties we are now growing in Florida. It is striking and attractive, but the quality of the fruit may not be equal to some of the best we already have. You know the papayas vary greatly in sweetness. Probably you noted my photographs of the *anay* growing in the forest at Mazatenango. Your idea of getting photos of the aguacate in the wild is a good one, and if I can find wild trees in the Alta Verapaz, -where people here seem to think they exist, I will try for some photographs. I hope the *anay* will turn out to be a new species. I am on the track of another species of Persea which grows down about Zacapa, and I saw in Amatitlan a single young tree which seems to be a Persea but is apparently not an avocado. I am going to get budwood of it."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

RECEIVED
MAR 14 1917
Division of Forestry
University of California

PLANT IMMIGRANTS

No. 125. SEPTEMBER, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Amygdalus	1045	Enbothrium	1047
Annona	1045	Nannorrhops	1048
Araucaria	1405	Phytelephas	1048
Canarium	1046	Prosopis	1049
Canavali	1046	Schinopsis	1049
Capparis	1046	Toona	1049
Cicer	1046	Triticum	1050
Cordeauxia	1047		

Plates:

Pl. 203. Row of Cajuput trees on the everglades, *Cajuputi* (*Melaleuca*) *leucodendron.*

204. The Chinese dry-land elm in Georgia, *Ulmus pumila.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 2, 1917.

Anyone desiring to publish any portion of this circular should obtain permission by applying to this Office.

Amygdalus persica L. (Amygdalaceae.) 43289-43291. **Peach** seeds from Canton, China, introduced for the study of the office of Horticultural and Pomological Investigations. Presented by Mr. P. R. Josselyn, American Vice Consul in Charge. Chinese peach trees are grown for the most part in the northern provinces, where the climate is cold. Those grown in Kwangtung Province are inferior in size, color and flavor to those grown further north. There are three species of peaches cultivated in this province, viz., the sweet, the sour and the bitter." (F. D. Cheshire.) *Ying Tsui T'ao* (eagle's beak). Very sweet with a point resembling the beak of the eagle and having a hairy coat. It is grown mostly at Sum Chuen, in the Pun Yu district; Poon Tang, in the Nam Hoi district; and also in the Fa Yuen, Samshui and Tung Kun districts." (Josselyn.) *Ha Mut T'ao* (honey-tasting peach). Very sweet, slightly round in shape; came originally from Manchuria. This peach is grown for the most part at Fati and Tong Kat and some other points in the Pun Yu district." (Josselyn.) *Shuen T'ao* (sour peach). Grown at various places in Canton, mostly in the hilly districts. Some are imported to Canton from Shui Kwan and Shui Tung district." (Josselyn.)

Annona cherimola x squamosa. (Annonaceae.) 43263. Seeds of **Atemoya** from Manila, P. I. Presented by Mr. Adn. Hernandez, Director of Agriculture. "Plants very similar in appearance to the cherimoya. The fruit is small, about 10 ounces in weight, yellowish green, with very thick tough skin and white tender flesh, juicy sub-acid. It has 4 to 7 seeds, darker colored than those of the cherimoya." (Wester, Philippine Agric. Review, p. 71, Feb. 1914.)

Araucaria brasiliana A. Richard. (Pinaceae.) 43383. Seeds from Monte Serrat, near Itatiaya, Brazil, collected by Dr. J. N. Rose and Mr. P. G. Russell, National Museum. "A tall evergreen tree native in southern Brazil, sometimes 100 feet high, with large and nearly globular cones. The wood is used in construction work, for turning, ships' masts, cabinet work and for matches. The thick resinous bark yields, by a fermenting process, an agreeable medicinal drink, and the ashes contain much potash; the resin exuded by the bark furnishes by-products useful in the industries and in medicine. The edible seeds produce white and delicate starch." (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 346, and from Correa, Flora do Brazil, p. 61.)

Canarium indicum Stickman. (Balsameaceae.) 43375. Seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Gardens. "A large handsome Malayan tree, characterised by a remarkable buttressed trunk and laterally compressed aerial basal roots; the latter develop enormous erect flanges of uniform thickness, so that solid circular pieces may occasionally be cut out from them to form ready-made cart wheels. The tree is much cultivated for shade or ornament in Java. It bears in great abundance large pendant clusters of dark-purple fruits, which are of the size of small plums; these are produced all the year around, but chiefly in June. The kernel of the fruit is edible, being similar in flavor to sweet almonds; it yields by expression an oil used for burning in lamps and for cooking purposes. A desirable tree for planting in avenues, etc. It thrives in hot and moist districts up to about 1500 feet elevation, and prefers deep, well-drained soil. Propagated by seed, which may be sown in nursery beds and kept moist and shaded until germinated." (H. F. MacMillan, Handbook of Tropical Gradening and Planting p. 146.)

Canavali gladiatum (Jacq.) DC. (Fabaceae.) 43380. Seed from Dindigul, South India. Presented by Rev. Willis P. Elwood, American Madura Mission. "The beans are a very good variety and are perennial. A kind of trellis or arbor should be provided for the beans to run on as they are rampant growers. The pods, when young and tender are cooked and no *Golden wax* bean can surpass them in quality. Of course, they are a purely tropical plant, but they would probably grow in the most southern parts of the country." (Elwood.)

Capparis micracantha DeCandolle. (Capparidaceae.) 43243. Seeds from Manila, P. I. Presented by Mr. Adn. Hernandez, Director of Agriculture, Bureau of Agriculture. "Seeds of a native fruit known locally as **Cambagat.** This fruit is about the size of a plum, bright red in color and has an exceedingly fine flavor, somewhat similar to a guava." (Hernandez.)

Cicer arietinum L. (Fabaceae.) 43273-43280. Seeds from Seville, Spain. Presented by Mr. Wilbur T. Gracey, American Consul, who secured them from Mr. Juan Matea Gimenez, Seville. "**Chickpeas.** or as they are called in Spain, **garbanzos,** are one of the principal

food products of that country, and may be said to be the staple food of the poorer classes. The seed, which is considerably larger than a pea, is encased in short, thick, hairy pods and forms, when roasted, the parched pulse of the East, and for this reason is sometimes known as the Egyptian pea. Chickpeas seem to thrive best in more or less arid regions, and for this reason the soil in the Seville consular district seems to be particularly suitable, owing to the intense heat and dryness of the summer months, and this district, which comprises the provinces of Seville, Cordoba, Cadiz, Huelva, Badajoz and Caceres, produces over half of the chickpeas grown in Spain. In that territory, the sowing is generally done in the month of March, and the crops are usually collected when the plants are perfectly dry at the beginning of August. It is said, however, that this practice is not to be recommended, as chickpeas which dry in the pods before being cut become exceptionally hard and are difficult to cook, as is not the case if they are collected when the plants become somewhat yellow, before they are absolutely dry, and are then piled in small heaps, and left to dry in a granary or well aired room." (Gracey.)

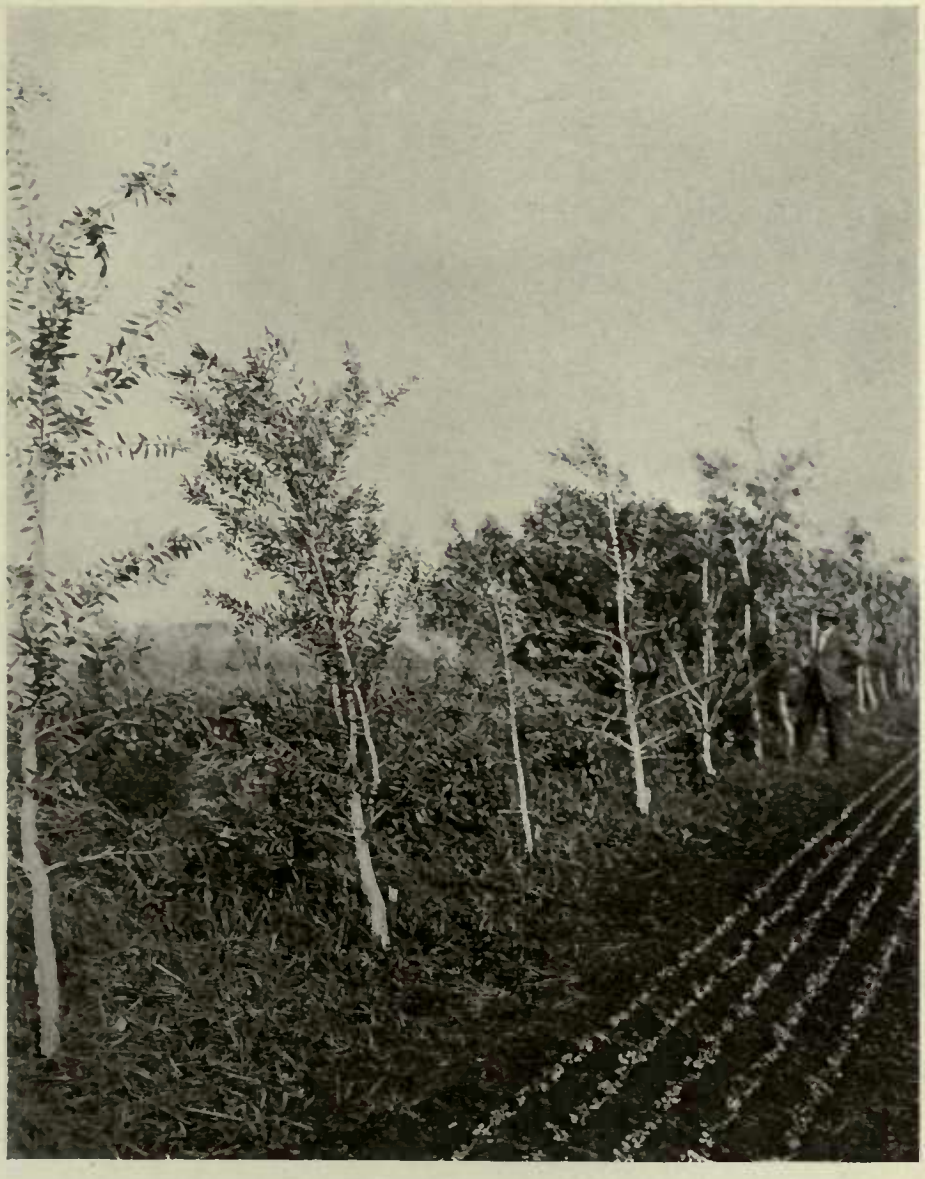
Cordeauxia edulis Hemsley. (Caesalpiniaceae.) 43260. Seeds of the **Yeheb Nut** from Aden, Arabia. Presented by Mr. A. G. Watson, American Vice-Consul, who obtained them from the Acting Governor of Italian Somaliland at Mogadiscio. A tree or shrub whose seeds have a high food value, and form an important article of commerce on the east coast of Africa, where they are eaten by the natives in preference to rice and dates. The plant grows where long droughts occur, the temperature not going below freezing. It quickly forms a long tap root, has evergreen leaves which stain the fingers magenta when crushed. It might be an excellent plant for the arid southwest. (Fairchild.)

Enbothrium coccineum Forster. (Proteaceae.) 43270. Seed from Bariloche, Argentina. Presented by Dr. Joseph Vereertbrugghen. A handsome evergreen shrub, about two feet in height, with oval, smooth, dark green leaves, nearly three inches long. The flowers are bright scarlet, and grow in racemes. This plant is chiefly confined to the Straits of Magellan and Tierra del Fuego, not reaching to Cape Horn. (Adapted from Curtis's Botanical Magazine, vol. 81, plate

4856.) "*Randal.* This is a beautiful tree and is giving wood that, here on the spot, is sold by the square inch. It is rather like hazelnut, perhaps nicer." (Vereertbrugghen.)

Nannorrhops ritchieana (Griff.) Wendland. (Phoenicaceae.) 43281. Seeds of the **Mazri palm** from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanical Gardens. A low gregarious shrub, ascending to 5500 feet in Baluchistan and Mekran, stemless ordinarily, but sometimes with a stem 10 to 20 feet long. The leaves are 2 to 4 feet long, grayish-green in color, and are beaten with a mallet to remove the fiber, which is used in making mats, baskets, etc. The fruit is a nearly round 1-seeded drupe. The flowers, leaf-buds, and fruits are eaten by the natives, and the seeds are made into rosaries. The reddish-brown wool of the petioles is impregnated with saltpeter and used as a tinder for matchlocks, and the whole plant when dried is used for fuel, in arid regions. In Europe it grows best in a compost of sandy loam, with good drainage, and is propagated by seeds and offsets. (Adapted from E. Blatter, Journ. Bombay Nat. Hist. Soc. vol. 21, pp. 72-76.)

Phytelephas microcarpa Ruiz & Pavon. (Phoenicaceae.) 43374. Seeds of the vegetable **ivory palm** from Pernambuco, Brazil. Presented by Mr. A. T. Haeberle, American Consul, at the request of the American Consul-General, Rio de Janeiro. This palm is found native along the banks of streams and on springy hillsides in the Peruvian Andes at an elevation of about 3000 feet, and is closely allied to the one which furnishes the vegetable ivory or *tagua* nut of commerce (*P. macrocarpa*), although it has smaller fruits. The slender inclined stem, sometimes absent entirely, grows up to 10 feet in length, and the fruits are about the size of a child's head, resembling externally some Annonas to such an extent that the Peruvians call them *Anon de palma,* but the palm itself is called *Yarina.* The thick furrowed rind is tough and is reddish within, and may be eaten, having a flavor of melon or mouldy cheese. The albumen of the unripe seeds is drunk while still watery, or eaten when it becomes fleshy, resembling in taste a coconut in like states, but when quite ripe is too hard for eating. (Adapted from description by Richard Spruce, furnished by C. B. Doyle.)



ROW OF CAJUPUT TREES ON THE EVERGLADES. CAJUPUTI (MELALEUCA) LEUCODENDRON (L.) LYONS.

Two-year-old trees from seed, planted by Mr. Robert Werner at the Davie Experiment Farm, Dade County, Fla.

The remarkable bark of this tree, composed of thin layers of soft cork which are easily separated from each other, and the oil of cajuput, which is used extensively in liniments and for skin diseases and of which the leaves contain a considerable percentage, combined with the extreme ease of propagation, abundance of seed, and the fact that the trees will stand flooding on the Everglades and even by brackish water, make this species worthy of special attention. Photographed (P20015FS) by David Fairchild at Davie Experiment Farm, Dade County, Fla., February 6, 1916.

THE CHINESE DRY-LAND ELM IN GEORGIA, ULMUS PUMILA, S. P. I. NO. 22975.

Specimens of this Chinese elm have attracted attention by their remarkable vigor and apparent adaptation to the severe winters and frequent dry summers of Iowa and the Dakotas, the rainy winters and cool summers of the Puget Sound region, the intense dry heat of the interior valleys of northern California, and the humid subtropical summer climate of the Gulf States. The tree illustrated has had five growing seasons from a small cutting and is now 27 feet tall and has a trunk circumference of 18 inches three feet from the ground. It stands on the place of J. B. Wight at Cairo, Ga., in unusually rich barnyard soil. Photographed (P19854FS) by R. A. Young at Cairo, Ga., August 10, 1916.

Prosopis spicigera L. (Mimosaceae.) 43282 Seeds from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanical Gardens. A deciduous thorny tree, found in the arid zones of the Panjab, Sind, Deccan, etc. It is easily raised from seed and coppices well. The tap root is enormously long, in one specimen measuring 86 feet in length, penetrating the soil to a depth of 64 feet. From the stumps of pruned branches and other scars a gum exudes, similar to gum arabic, but, although worthy of investigation, hitherto not used. The bark of the tree is used as a tan. The pods are sometimes used for medicinal purposes, but more often are employed as fodder, and in some localities the poorer classes eat the bark. (Adapted from Watt, Dictionary Econ. Prod. India, vol. 6, part 1, p. 340-341.)

Prosopis strombulifera (Lam.) Bentham. (Mimosaceae.) 43386. Seeds from Argentina. Collected by Dr. J. N. Rose, and Mr. P. G. Russell, U. S. National Museum. "This grows commonly in the Mendoza desert and is a low shrub not over twelve inches high. Its peculiar screw shaped pods look like bright yellow spikes of flowers a short distance away. The plant might prove to be a very good hedge or border plant in western Texas and Arizona. The pods hang on long after the leaves have fallen." (Rose.)

Schinopsis lorentzii (Griseb.) Engler. (Anacardiaceae.) 43352. Seeds from Buenos Aires, Argentina. Presented by the Director, Botanic Garden. "Tree with very hard wood, unequally pinnate coriaceous compound leaves, flowers in branched panicles; fruit a samara. The products which are extracted from this tree constitute the principal resource of the inhabitants where the tree grows. It is one of the Argentine woods which, exposed to the air, buried in part or entirely, or submerged in water, will keep 25 years in good condition, as attested by experiments made by the Argentine railway with posts, beams, ties, etc. When full-grown, the logs are made into beams, ties, telegraph poles, etc., and exported in large quantity. The charcoal is very compact; and the extract (tannin) is an important product. The saw-dust is much used as an astringent." (Carrasco.)

Toona ciliata Roemer. (Meliaceae.) 45288. Seeds of
Toon tree from Darjeeling, India. A large, rapidly

growing decidous tree, 50-80 feet high, and sometimes 20 feet in diameter, growing chiefly near streams in tropical sub-Himalayan regions, also in low elevations in western and southern India. The wood obtained from this important timber tree is not eaten by white ants, is durable and not liable to warp. It is used for furniture, carvings, cigar and tea boxes. The bark is used as a tonic, and the flowers are the source of red and yellow dye. The seeds, young shoots and leaves are given to cattle as fodder. (Adapted from Watt, Commercial Products of India, p. 290, under *Cedrela toona.*)

Triticum spp. (Poaceae.) 43340-43373. From Montevideo, Uruguay. Presented by Mr. L. Moreira Acosta, Laboratorio Agronomico. "A collection of prize wheats of the First National Exhibit of wheats. These wheats are degenerates, but adaptable to our climate, which has several drawbacks to the cultivation of cereals, due to their resistance and robustness. You will be able to judge our progress in the cultivation of this cereal which has only in late years had scientific attention devoted to it by our agricultural experts who have studied in our institutes." (*Acosta.*)

Notes from Correspondents abroad.

Mr. Wilson Popenoe writes from Guatemala City, January 18, 1917, as follows:

"I am just back from a successful trip through the Highlands. I went in company with a young American from Boston, who is here in the interests of the Babson Statistical Organization. Our route was as follows: From Guatemala City to Chimaltenango the first day, stopping there over night, and riding the second day to Tecpan. Here we spent a day, and then rode to Panajachel, where we spent another day and rode to Solola, thence to Totonicapan. Here we spent a day and then rode to Quezaltenango, where we spent two days, and then walked to San Felipe, whence we took the railroad to Mazatenango, stopped there a day, and came on back to Guatemala City. It was a very interesting trip but one of the coldest propositions I have met in a long time. Between Solola and Totonicapan we rode at midday for several miles over a plateau just below 10,000 feet in elevation, where the ice had not yet melted in the puddles beside the road, And this in the Tropics! For about a week we were above 7000 feet nearly all the time, and of course I

was on the lookout for avocados. What I have been trying to ascertain is, How high can the avocados be grown in Guatemala? Previously I had never seen it above 7000 feet, which is about the extreme limit of the orange zone. But on this trip, I found avocados at Tecpan (7500 ft.) and most remarkable of all, at Totonicapan (8500 ft.) On looking carefully over the town, I found that most of the trees in the gardens were peaches, apples, the wild cherries which occur in this part of Guatemala, and a few other hardy things,- strictly temperate in character. The matasano (*Casimiroa edulis*) was seen here and there. I found three or four young avocado trees in protected situations which had escaped the frost and looked pretty well and then found two large trees which had been frozen badly. They had the limbs killed back to the trunk, and scarcely a leaf on them. So far it did not look very promising. But finally I ran across a large tree growing in a patio (practically all of them were in patios) which had escaped practically uninjured, stood 40 feet high, and was carrying quite a little fruit. On examination the fruit proved to be of first-class quality. The idea of growing avocados 1000 feet or more above the zone in which oranges can be grown strikes me as rather surprising. Aside from the avocados, there was scarcely anything of interest in Los Altos, as that region is called. The wild cherry was in bloom and I will see it again in fruit, probably, when I go back to Totonicapan. That is a remarkable region, sure enough; wheat and oats, principally wheat, with some apples and peaches in the towns, but practically all seedlings, of course. On the way back we spent a day at Mazatenango, and I went out to look up the *anay.* I found that the tree had bloomed recently and was full of young fruit; it was also carrying a lot of ripe fruit which I did not see when I was there before. It looks as though it must bloom twice a year, as I was told it bloomed in April and had not expected to find it in bloom as yet. I obtained 150 fruits and am taking the seeds down to Quirigua to plant. I plan to go down to Amatitlan in a couple of days and cut some more budwood to put in this week's mail. When I said that one of the varieties from San Cristobal was the best avocado I had seen, I did it deliberately. It is really a magnificent fruit. If course I cannot forecast its behavior in the States, but as a fruit it is certainly splendid. As to the *coyo,* I did not intend you

to understand that I consider it a superior fruit to avocado. I think I said, or at least I intended to say, that I thought its flavor was really superior to that of the avocado. It has some weak spots, of course, but I am strongly impressed with its remarkably rich and nutty flavor. Kensett Champney considers that its flavor is superior to that of the avocado. He seems to think it "wears well" but of course I can not state my own experience. I will admit that I am somewhat enthusiastic over it. As you know, I have a habit of getting enthusiastic over these new things. After my second trip to the Verapaz, I will write up an account of the *coyo*, tempered with as generous an amount of conservatism as I can muster, and send it up to you. I want to get a little more data than I now have. As it grows wild up to 5000 feet or above, it must be about as hardy as the Guatemalan avocado. Many thanks for Dr. Galloway's notes re the condition of my shipment of budwood from the Verapaz. They were a great help to me, because of their clearness and comprehensiveness. I regret that I cannot enthuse over the *Pacaya.* I have eaten it several times, under protest, and unless the inflorescences are very young they are bitter. When very young they form an excellent matrix for salad dressing. The palm is a beauty, however, and fairly hardy. It ought to be given a wide trial in Florida and California. The work here remains fascinating. There is a great deal to be done yet before I will feel satisfied to end the search for the best avocados, but I am pushing things as best I can, and I hope nothing will happen to knock us out. I am in the pink of condition. I neglected to mention in this letter that I have found the first serious injury done to avocado fruits which I have seen in Guatemala. At Panajachel that larva which bores in the seeds, and which seems to be the same as the one Mr. Sasscer found in some of the seeds I sent up, is causing tremendous damage. I have some photos of fruits cut open, showing the injury, which I will send up soon and which will make the matter much stronger than I can do it with words. A large percentage of the fruits I examined were infested, and many were so badly so that they were not fit to eat. This is unquestionably a serious thing, and one we must guard against carefully. I have some infested seeds in an improvised breeding cage and am going to see if I can breed out some of the adult insects."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in Charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF DIVISION OF
FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 126. OCTOBER, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1055	Ilex	1062
Achradelpha	1055	Lepargyrea	1063
Acrocomia	1055	Lonchocarpus	1063
Alibertia	1056	Mida	1064
Annona	1056	Passiflora	1064
Belou	1057	Persea	1064
Berberis	1057	Pinus	1067
Byrsonima	1058	Piptadenia	1067
Canarium	1058	Prunus	1068
Carica	1058	Pyrus	1068
Cedrela	1059	Rubus	1069
Chayota	1059	Saccellium	1069
Chrysophyllum	1060	Schinopsis	1069
Crataegus	1061	Sicana	1070
Enterolobium	1061	Simaba	1070
Garcinia	1062	Virola	1071

Plates:

Pl. 205. Passion flower in full bloom, *Passiflora sp.*
206. Young fruits and flowering branch of passion vine, *Passiflora sp.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 29, 1917.

Anyone desiring to publish any portion of this circular should obtain permission by applying to this Office.

Acacia visco Lorentz. (Mimosaceae.) 43453. Seeds of the *visco* from Argentina. Collected by H. M. Curran. A tree, native of northern Argentina, commonly unarmed, but occasionally with re-curved thorns. The leaves consist of three to six pairs of pinnae, and the flowers are sessile. The walnut-colored hard wood is striped and much appreciated on account of its resistance to moisture. It is not abundant, and is used for all kinds of carpentry. (Adapted from Grisebach, Plantae Lorentzianae, p. 122, and from Lillo, Contribucion Arboles Argentina, p. 36.) "Timber tree. Yields a very hard durable wood but is a small tree of the dry regions and should be useful for planting in the Mesquite areas of the south-west." (Curran.)

Achradelpha viridis (Pittier) O. F. Cook. (Sapotaceae.) 43439. Seeds of *injerto* from Palin, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "No.46a. *Injerto.* Seeds from fruits purchased in Palin, but said to have been grown at Santa Maria de Jesus, between Palin and Antigua. The *injerto* is a common tree in this part of Guatemala. Unlike its near relative, the sapote (*Lucuma mammosa*), which seems to thrive only at comparatively low elevations in the tropics, the *injerto* is grown as high as 5000 or 6000 feet, and should, therefore, stand a better chance of succeeding in California and Florida than the sapote, which has, so far, been a failure in those states. The tree grows to a height of about 40 feet in this region, and has long, slender leaves suggesting those of the sapote. The fruits vary somewhat in shape, but are commonly round to oval, often pointed at the tip. They are two to three and a half inches in diameter, smooth, dull yellow-green in color, sometimes becoming almost dull yellow. The skin is not thick, and adheres closely to the flesh, which is red-brown in color, soft and melting, sweet with a pleasant flavor, somewhat resembling that of the sapote, but better. The large seed (sometimes there are two) is hard and polished, deep brown in color, and is easily removed from the pulp." (Popenoe.)

Acrocomia mexicana Karw. (Phoenicaceae.) 43484. Seeds of a **palm** from Villahermosa, Tabasco, Mexico. Presented by Mr. G. Itie, Director, Agricultural Experiment Station. "*Coyol de savana* or *cocoyol.* The natives use the fruit in making a dessert, cooking it with brown sugar. Rings are made from the shell." (Itie.)

A prickly palm, about 20 feet high, with a brown woolly trunk up to 1½ feet thick, and terminal leaves from 6 to 8 feet in length. The sheathing bases of the leaves are armed with long, black spines, and the spathe is very spiny. The yellow flowers are very odorous, and the round fruits are about an inch in diameter. This palm is found in the cooler regions of Mexico up to 3000 feet above the sea, and is said to be hardy at Santa Barbara, California. (Adapted from Mueller, Select Extra-Tropical Plants, p. 19, from Bailey, Standard Cyclopedia of Horticulture, p. 211, and from Martius, Historia Naturalis Palmarum, pp. 285, 286 and plate 138.)

Alibertia edulis A. Richard. (Rubiaceae.) 43413. Seeds from Tierras de Loba, Bolivar, Colombia. Collected by Mr. H. M. Curran. A tropical and extra-tropical shrub found in Central and northern South America, with white flowers and yellow fruit, which is about the size of a small lemon, and is called *Marmeladinha.* The entire plant is called *Puruhy,* both of these being Brazilian names. The fruit is edible and very agreeable in taste. (Adapted from von Mueller, Selected Extra-Tropical Plants, from Pittier, Plantas Usuales de Costa Rica, p. 110, and from Correa, Flora do Brazil, p. 112.)

Annona purpurea Moc. & Sesse. (Annonaceae.) 43426. Fruit of **Soncoya** from Escuintla, Guatemala. Seed collected by Mr. Wilson Popenoe, Agricultural Explorer. "The *suncuya* or *soncuya,* sometimes called *chincuya,* a remarkable species of Annona which appears to be fairly common in the foothills of the western slopes of Guatemala. Fruits and trees were seen from Escuintla to Ayutla, on the Mexican frontier, the elevation varying from 200 to 1200 feet. The soncuya is an immense fruit, often larger than a child's head, and covered with short conical protuberances. It is almost perfectly spherical in form, measures about six inches in length, and weighs three pounds or more. In color it is a light russet brown, sometimes greenish, and the protuberances are about ¼ inch long, sharply pointed, and corky in character. The rind also is corky, about ¼ inch thick, rather pliable, granular and easily broken. The flesh within is pale orange, cottony in texture, rather juicy and with an aroma and flavor almost identical with that of the North American pawpaw (*Asimina triloba*). The seeds are very

numerous, brown, shaped like that of the cherimoya but much larger, being fully one inch long. The tree is grown in dooryards, and is said also to occur in the forests, but up to the present I have only seen it in cultivation. It grows to about the same size as the cherimoya, and is of the same form, but the foliage is much larger, and makes the tree a striking object in gardens. The fruit is a common object in markets and fruit stalls, and seems to be generally used by the Indians, though an overindulgence in it is said to superinduce *paludismo* or malarial fever. The tree grows on deep loamy soils, very rich and generally moist, and is probably suited only to regions with very warm climate. It if succeeds at all in California, it will probably be only in the most protected locations; in Florida it ought to have somewhat more favorable climatic conditions, at least in the lower end of the peninsula. The soncuya, which is probably unknown in cultivation outside of Central America is a fruit of much better quality than most of the wild annonas, and seems to be especially worthy of attention because of its thick outer rind, which makes it easier to handle the fruits without bruising them, than is the case with the cherimoya." (Popenoe.)

Belou marmelos (L.) Lyons. (Rutaceae.) 43478. Seeds of **Bael tree** from Honolulu, Hawaii. Presented by Mr. J. E. Higgins, Horticulturist, Agricultural Experiment Station. This plant is the *Bael Tree* of India, ascending to 4000 feet above the sea, and found here and there both wild and cultivated throughout India and also Burma. It finally attains a height of 40 feet. The leaves are trifoliate and deciduous, and the greenish-yellow, nearly globular fruit varies from 2 to 6 inches in diameter, being smaller in the wild trees. The hard shell is filled with pale orange, aromatic pulp, in which occur 10-15 long, narrow cells containing the seeds imbedded in transparent gum. The Hindus are very fond of this fruit, and in its green state it is a specific for dysentery. It is now being tested in several places in the United States. (Adapted from Swingle, in Bailey, Standard Cyclopedia of Horticulture, pp. 222, 223, and from Mueller, Select Extra-Tropical Plants, p. 20.)

Berberis fremontii Torrey. (Berberidaceae.) 43474. Plants of **barberry** from Lyford, Texas and San Saba, Texas. Collected by Dr. David Griffiths and grown at

the Plant Introduction Field Station, Chico, Cal. "A native of southern and central Texas. Like the other species of the genus it has ornamental value. Besides this, the berries are used for culinary purposes. In some localities, where the species is very abundant, jellies are prepared and offered for sale on the markets. The species is tremendously variable." (Griffiths.)

Byrsonima crassifolia (L.) H. B. K. (Malpighiaceae.) Seeds of **Nance** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A small tree frequently seen in gardens, especially in villages along the west coast, where it is a common dooryard tree. It is erect, with a slender trunk sometimes dividing near the base, and up to 35 feet in height. The leaves are obovate-elliptic to elliptic, acute, 3 to 4 inches long, thickly chartaceous, deep green and glabrous above, covered with thick tawny hairs beneath. The fruits are born in short terminal racemes 2 to 3 inches long, and individually are the size of cherries, bright yellow in color when fully. The single rough seed is about the size of a cherry stone. The flavor of the fruit is acid, and sometimes rather strong. The Nance grows here at elevations from sea level up to 4000 feet or above, the soil being usually a rich loam. It may succeed in California, when grown at places such as Santa Barbara, which do not experience a great deal of frost, and it ought to succeed in south Florida." (Popenoe.)

Canarium amboinense Hochr. (Balsameaceae.) 43450. Seeds from Buitenzorg, Java. Presented by the Director, Botanic Garden. This beautiful tree, which grows to a height of about 90 feet, so resembles *Canarium moluccanum* in general habit and in the leaves that the two can scarcely be distinguished, although the fruit is different. The bark is smooth and white. The fruit of this species is oblong, pointed at both ends, with angles sharp toward the ends and somewhat flattened toward the middle. This tree is found in the island of Amboina, Celebes. (Adapted from Hochreutiner, Plantae Bogoriensis Exsiccatae, p. 55.)

Carica papaya L. (Papayaceae.) 43428. Seed of **papaya** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A remarkable variety of papaya which seems to be fairly common in

the markets here, and is said to come from Escuintla. The fruit from which these seeds were taken is cylindrical in form, 13½ inches long by 6 inches thick, pointed at the apex. The flesh was thick, varying from 1½ to 1¾ inches, firm, and not at all musky in flavor. It was rather lacking in sweetness but this may have been due in part to the fact that the fruits are some times picked before fully ripe to permit of shipment. The great peculiarity of its variety lies in the color of the flesh, which was a deep reddish salmon. The seeds were oval in form, and quite numerous. Other specimens of this same variety which have been seen in the market were similar to the one described but smaller. This interesting form should be tried in connection with the investigations in papaya culture now being carried on in south Florida." (Popenoe.)

Cedrela fissilis Velloso. (Meliaceae.) 43417. Seeds of **Cedro** from Bolivar, Colombia. Collected by Mr. H. M. Curran. A tree with pinnate leaves 10-15 inches long, densely pubescent beneath, and 18-24 opposite, nearly sessile leaflets. The panicles of whitish flowers are longer than the leaves, and the fruit is a dehiscent capsule containing many flat, winged seeds. According to Franceschi it does better at Santa Barbara than any other species of this genus. (Adapted from Bailey, Standard Cyclopedia of Horticulture, pp. 697-698.)

Chayota edulis Jacq. (Cucurbitaceae.) 43422. Fruits of **Chayote** from Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Large white **perulero,** undoubtedly one of the very best varieties of chayote or *guisquile* grown in Guatemala. Its attractive appearance, smooth surface, freedom from spines and deep sutures, and its excellent quality make it seem worthy of a careful trial in the southern United States. This variety belongs to the class known as *perulero,* or Peruvian chayotes, a group which seems to include a good many small to medium sized, smooth varieties, as distinguished from the *guisquiles* proper, larger fruits, usually with sutures on the surface, and often spiny. This large white *perulero* is considered of superior quality, the flavor being very delicate, and due to the absence of spines and sutures it is very easy to prepare for the table." (Popenoe.)

Chayota edulis Jacq. (Cucurbitaceae.) 43393-43401. From Guatemala City, Guatemala. Collected by Mr. Wilson Poponoe, Agricultural Explorer. "The **chayote** which is here called *guisquil*, is one of the commonest vegetables in this part of Guatemala, and exists in a number of varieties. The following set includes those which have been seen commonly in the market during the past two weeks. Two classes of chayotes are distinguished in the markets, *guisquiles* proper, and *guisquiles pereros*, or Peruvian *guisquiles*. The former includes practically all of the larger fruit, varying from green to white in color, some prickly and some smooth, the surface usually somewhat roughened, sometimes with deep sutures from base to apex. The second class, *guisquiles peruleros*, includes small fruits, white to green in color, with the surface smooth and free from prickles or soft spines. Both classes are exceedingly abundant in the markets."

Chayota edulis Jacq. (Cucurbitaceae.) 43477. Fruits of **Chayote** from Santo Domingo, Dominican Republic. Received through Mr. Carl M. J. von Zielinski, American Vice Consul in charge. "Information from reliable sources states that the cultivation of this plant is very simple. It should be planted in a moist soil preferably where there is plenty of shade. Its growth is said to be wonderful and after ninety days it is known to produce over 100 fruits. There are two kinds of *tallote* as the chayote is called here, found in this country but the difference is said to be only in the color of the skin which is either white or green. The plant is very much liked by the natives and is prepared in many ways for use in soup, and meat dishes; also in the manufacture of candy. Native physicians prescribe it not only as food for children and old people, but also to be used externally. The leaves are boiled and then used to cure rheumatism. Animals are very fond of the fruit as well as the leaves." (Zielinski.)

Chrysophyllum lucumifolium Grisebach. (Sapotaceae.) 43454. Seeds of **Aguay** from Argentina. Collected by Mr. H. M. Curran. A tree, found in Missiones and Corrientes, Argentina, with beautiful broad green leaves and axillary or lateral flowers. Only one seed matures in the oval fruit which is 12 mm. long. This tree sometimes attains considerable size, and the wood, which is flexible and easily split, is used for

fire wood and gun stocks. The fruit is edible and very sweet. (Adapted from Grisebach, Plantae Lorentzianae, pp. 223-224, and from Lillo, Contr. Arboles Argentina, p. 96.)

Crataegus sp. (Malaceae.) 43430. Seeds from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "**Manzanilla**, a common fruit in the markets of Guatemala towns and villages, coming, it is said from the highlands. I have seen no plants as yet. The fruits look like small apples; they are nearly spherical in form, an inch to an inch and a quarter in diameter, deep yellow in color with russet dots and one cheek frequently blushed with red. The thin skin encloses a rather dry, mealy pulp and three irregularly shaped seeds. The flavor resembles that of some of the northern haws, but is, perhaps, somewhat better; the fruit is extensively used here for the preparation of *dulces* of various sorts, such as jams and jellies. This plant would probably succeed both in California and Florida." (Popenoe.)

Enterolobium timbouva Martius. (Mimosaceae.) 43455. Seeds of **Timbo** from Argentina. Collected by Mr. H. M. Curran. A tree found throughout all of northern Argentina, and used as an ornamental in Buenos Aires. It is unarmed, and the leaves consist of two to five pairs of pinnae and ten to twenty pairs of pinnules. The greenish flowers occur in large heads or clusters, and the coriaceous, indehiscent, kidney-shaped pods are fleshy within and contain elliptic seeds. These pods are called *orejas de negro* in Argentina. From the trunks canoes are made, and the beautiful, striped wood is used for a great many purposes, such as general construction work, furniture, etc., and for paper pulp, and is a source of saponin. The bark and leaves are said to be poisonous to fish, and the pods are used to remove stains from clothes, and the seeds appear to be poisonous. (Adapted from Lillo, Contrib. Arboles Argentina, p. 41, from Correa, Flora do Brazil, p. 70, and from Bailey, Standard Cyclopedia of Horticulture. p. 116.) "Is a very important timber tree and one of the most rapid growing trees of the tropics. Much appreciated in Buenos Aires as a shade tree. Reaches its best development in tropical forests but endures cold and drought in a moderate form." (Curran.)

Garcinia mangostana L. (Clusiaceae.) 43481. Seeds of Mangosteen from Peradeniya, Ceylon. Presented by Mr. C. Drieberg, Secretary, Ceylon Agricultural Society. "A moderate-sized conical tree, with large leathery leaves, indigenous to Malaya. Its globular purplish brown fruit, about the size of an apple, is famed as one of the most delicious fruits of the tropics, some writers describing it as 'perhaps the most luscious fruit in the world, partaking of the flavor of the strawberry and the grape.' The delicate white juicy pulp surrounding and adhering to the seed is the part eaten. In striking contrast to it is the dense, thick, reddish rind, containing tannic acid and a dye. The fruit is in season in the low country of Ceylon from April to June, and at higher elevations from June to August or September. Here it is usually sold in the markets, or hawked about, at 75 cents (Ceylonese) to 1 rupee per dozen; (24 to 32 cents U.S. gold.) It is always charged for on hotel menus as an extra. The tree is of very slow growth, and does not usually come into bearing till about nine or ten years old. The essential conditions for it are a hot, moist climate, and deep, rich well-drained soil. It thrives up to 1500 feet elevation in the moist region, but may also be grown in moderately dry districts with irrigation. Propagation is usually by seed, but may also be effected by gootee or layering. Sow seeds in pots under cover. The plants are of very slow growth, taking about two years to become large enough for planting out, being then only about 12 inches high." (Macmillan, Handbook of Tropical Gardening & Planting, p. 164 & 165.)

Ilex paraguariensis St. Hilaire. (Aquifoliaceae.) 43456. Seeds of **Yerba de mate** from Argentina. Collected by Mr. H. M. Curran. A small, bushy, evergreen tree with serrate alternate leaves, native of Brazil and Paraguay and the neighboring countries. The leaves are roasted and ground to make the Paraguay-tea of commerce, which is said to possess the good properties of tea and coffee without their after-effects. In the hospitals of Paris it is used as a stimulant. The Yerba groves are located in remote regions, and grow best on high land at an elevation of 1,000 to 2,000 feet, in soft alluvial soil or soil rich in humus. The seed is very difficult to germinate, and without special treatment requires a year before it will come up. An opinion prevails that these seeds will ger-

PASSION FLOWER IN FULL BLOOM, PASSIFLORA SP., S. P. I. No. 35215.

Although passion flowers have been grown in the conservatories of Europe for generations and their remarkable flowers considered emblems of the Crucifixion, and although at least one species (*P. edulis*) has become of commercial importance in Australia and is even grown for market in Scotland, practically no attention has been given to them by Americans. The ease with which they can be grown, their productiveness, the existence of so many edible-fruited species, and the fact that they hybridize readily would seem to make the field of their exploitation a promising one. Photograph (P19576FS) taken by P. H. Dorsett, in greenhouse at Chico, Cal., Field Station, May 16, 1916.

YOUNG FRUITS AND FLOWERING BRANCH OF PASSION VINE, PASSIFLORA SP.

The large flowers, ease of propagation from cuttings, existence of numerous edible fruited species, and the unique and delicate flavor of the finer sorts, together with the unrivaled shipping qualities of the fruit and the presence of hardy species in America would seem to make the problem of creating a new hardy fruiting vine for the Southern States a promising one. Photograph (P19657FS) taken by P. H. Dorsett, Chico Field Station, May 16, 1916. Natural size.

minate only after being eaten by birds, and a substitute for the gastric juice of the birds has been sought. By a method in use at San Ignacio, Argentina, seedlings have been obtained in five weeks. This plant might be grown in Texas and California. (Adapted from Friderici, Tropenpflanzer, 1907, pp. 776-783.) The *Ilex* is a plant of humid forest regions but will also endure the climate of Buenos Aires. It should be a good plant for Florida and perhaps the coast region as far north as the Cape Fear River, North Carolina. In nature it is a forest plant. In cultivation a light shade is often placed over the plants." (Curran.)

Lepargyrea argentea (Pursh.) Greene. (Elaeagnaceae.) 43472. Plants of Buffalo berry secured near Pierre, South Dakota. Collected Dr. David Griffiths and grown at the Plant Introduction Field Station, Chico, Cal. "The **Buffalo berry** is a native of the Missouri river valley and westward. In limited localities it has played a rather important role as a jelly fruit. It grows into a large shrub or small tree, resembling rather closely in leafage the so-called Russian olive belonging to the genus *Elaeagnus.* The fruit is about the size of a currant and varies in color from yellow to red. It is not at all palatable until very late in the season, after it has partly dried so that the skin is wrinkled and presents a withered appearance. To most tastes it is not palatable at all in the raw state, but makes a jelly of very superior quality. The fruit is gathered by shaking the trees very late in the season, and catching the falling berries upon sheets. The yellow form is usually preferred to the red for culinary purposes." (Griffiths.)

Lonchocarpus sp. (Fabaceae.) 43457. Seeds from Argentina. Collected by Mr. H. M. Curran. The species of this genus are either trees or shrubs, with alternate leaves and opposite leaflets. The papilionaceous flowers are white, pink or purple, and occur in simple or branched racemes. The membranous or coriaceous pods are flat and dehiscent, containing from one to four or rarely more flat, kidney-shaped seeds. An indigo-like dye is said to be obtained from this genus, but it is not known in the trade and is little cultivated. (Adapted from Humboldt, Bonpland & Kunth, Nova Genera et Species, vol. 6, p. 383, 182, and from Bailey, Standard Cyclopedia of Horticulture, p. 1904.)

Mida acuminata (R. Br.) Kuntze. (Santalaceae.) 43423. Seeds of **Quandong** from Sydney, Australia. Presented by Mr. Fred Turner of the Linnean Society, through the American Consul General. "Var. *Chrysocarpa.* A rare Australian tree. From an economic point of view, the yellow quandong is a superior fruit to the red quandong, and it grows under precisely similar climatic conditions." (Turner.) A beautiful evergreen tree, up to 30 feet in height, with opposite, lanceolate leaves, mostly two or three inches long, and rather numerous insignificant flowers, appearing on small, terminal branches. The reddish, globular fruits are about three-fourths inch in diameter, and are eaten as preserves and jelly, and in the dried condition. The kernels, which are spherical, are quite palatable, and so full of oil that they will burn entirely away with a clear light. The tree, when full of fruits, is decidedly ornamental. The bark contains a large amount of tannic acid, and the wood is used for turnery carving and cabinet work. In cultivating this tree, it is best raised from seeds planted in the places where it is intended that the trees are to grow permanently. This tree is found throughout Australia, except Tasmania and Queensland. (Adapted from F. Turner, Sydney Morning Herald.)

Passiflora ligularis Juss. (Passifloraceae.) 43437. Seeds of **Granadilla** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A species of Passiflora cultivated in the highlands of Guatemala, up to to elevations of 5000 feet or above. The fruit is the size of a hen's egg, orange-yellow in color when fully ripe, with a thick brittle shell enclosing a large number of small, thin seeds by white, gelatinous pulp. The flavor is delicate, aromatic, almost perfumed, certainly more delicate and agreeable than most of the other Passifloras which produce edible fruits. This species should be given a more thorough trial in Florida and California than has been done in the past." (Popenoe.)

Persea americana Miller. (Lauraceae.) 43476. Cuttings of **Avocado** from Amatitlan, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A fruit of good size, averaging about one pound in weight, of very desirable shape, regularly oval, with a seed rather small in comparison to the size of the fruit. The surface is smooth, deep green in color; the quality

is said to be very good, and the tree is productive. Taken all around, it looks like a very excellent quality. The parent tree is young, probably 5 or 6 years old, and stands about 20 feet in height, with an erect crown, extending almost to the ground, about 10 feet broad, and well branched. The trunk is 6 inches thick at the base. The tree is producing over 100 fruits this year. At this time they do not appear to be quite mature. They are said to ripen in November, at the same time the flowers for the next year's crop make their appearance. Doubtless they would be much better in quality if left on the tree several months longer, but it is the usual thing here to pick the fruits as soon as they reach maturity. A description of the fruit follows: Form uniformly oval; size above medium to large, weight 14 to 18 ozs., length 4½ inches, greatest diameter 3½ inches, base rounded, with the stem inserted obliquely without depression; stem stout, about 6 inches long; apex rounded, with the stigmatic point to one side and slightly raised; surface nearly smooth, slightly undulating and sometimes obscurely ribbed, deep green in color, almost glossy, with a few scattering large yellow dots; skin thick, slightly over 1/16 inch at base, nearly ⅛ inch at apex, coarsely granular, brittle; flesh cream color, pale green near the skin, free from fiber; flavor said to be rich; quality probably very good; seed rather small in comparison to size of fruit, almost spherical, 1¾ inches long and broad, with both seed coats adhering closely, and tight in the seed cavity." (Popenoe.)

Persea sp. (Lauraceae.) 43432. Seeds of **Anay** from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "An interesting species of Persea which occurs in this region as a large forest tree, and is called *anay* by the natives. It so closely resembles an avocado of the Mexican type in the external appearance of the fruit as to lead one to suspect at first that it must be a form of *Persea americana,* but on a closer examination of the tree and fruit, one finds numerous characters which indicate that it must be an entirely distinct species of *Persea,* but just what species it may be I am unable to say. In clearing the forest for planting coffee, some large trees are left to provide shade for the coffee plants, and it was due to this fact that we found the *anay.* Two large trees are standing close to the entrance of the

finca 'El Compromiso', about one-half mile from Mazatenango. Others are said to occur in the forest, and are known to the natives, who eat the fruits in the same way as avocados, and consider them a variety of avocado,- 'tipo de aguacate', as they say. The *anay* is a tall, rather slender tree, reaching to a great height in the forest, the two which were seen being, probably, between 60 and 70 feet in height. The bark is nearly smooth, and of a rich red-brown color, grayish in places. The young branchlets are light brown, and finely pubescent. The leaf blades are broadly elliptic to oblong-lanceolate in outline, 8 to 13 inches long, 3 to 6 inches broad, acute to shortly acuminate at the apex, rounded to broadly acute at the base, rigidly chartaceous, bright green and glabrous above, with the exception of the costa and primary transverse veins, which are sparsely hairy, the lower surface slightly lighter in color and glabrate. The young leaves are softly pubescent below, sparsely hairy above. Petiole 1½ to 2½ inches long, terete, slender, but swollen just below the point of union with the lamina. The foliage, when crushed, has no aromatic odor as does the Mexican type of *P. americana.* The flowers are said by the natives to be produced in May. The fruits ripen in August and September. In form they are slender pyriform, sometimes curved, and sometimes pointed at the apex. Often the neck is long and sharply defined. The body of the fruit is slightly compressed on two sides. In length the fruit varies from 4 to 6 inches. The surface is smooth, glossy, and purplish black in color. The epicarp is exceedingly thin and membranous, and adheres closely to the firm, oily flesh, which is divided into two zones of color, the outer being pale green, and the inner, which is of the same thickness as the outer, greenish cream color. The two zones are more sharply defined than they ordinarily are in the cultivated avocados. The flavor of the flesh is rich and bland, like that of a very good avocado, but having a faint suggestion of sweetness. The outer seed coat is developed into a thick husk which may be practically be considered an endocarp. Within lies the seed, which is long and pointed, with the inner seed coat, thin and membranous, surrounding the cotyledons closely. While the outer seed coat is extended clear to the base of the fruit, the inner does not always reach the apices of the cotyledons. The embryo lies immediately at the base of the cotyledons, while the avocado has the em-

bryo located some distance above this point. From a practical standpoint, the *anay* cannot be considered of great value, inasmuch as the flesh is scanty in quantity. If it were more abundant, its excellent flavor would make the fruit of great value. The fruit falls to the ground while still hard, and requires two or three days to soften and be in condition for eating. The seeds germinate on the ground beneath the trees, and the young plants start off lustily. The larva of some insects, presumably a beetle, attacks the fallen fruits, and tunnels through the seeds. Very few fruits were found on the ground which had not been attacked in this manner. The remarkable similarity which this species bears to the cultivated avocado, and the fact that its fruit is edible and is used by the natives, makes it a subject of particular interest in connection with the study of the cultivated avocados. It is to be hoped that specimens can be reared and fruited in the United States. The region where the tree is found lies at an elevation of about 1200 feet, and is quite moist. On this account, it seems doubtful if the *anay* will succeed in California. It might be tried in the most protected localities. In south Florida its chances of success seem good." (Popenoe.)

Pinus merkusii Jungh. & DeVriese. (Pinaceae.) 43462. Seeds of a **pine** from Buitenzorg, Java. Presented by the Director, Botanic Gardens. This tree, which is the only pine found south of the equator, attains a height of 100 feet, and forms a flat, umbrella-like crown. It is found in Burma, Borneo, Sumatra and the Philippines, chiefly at elevations of 3000 to 4000 feet. The leaves are in clusters of two, the cones are usually in pairs, and the seeds are small, much shorter than the unequal-sided wing. The wood is very resinous, and the trunks are used for masts and spars. (Adapted from Brandis, Indian Trees, p. 691, and from von Mueller, Select Extra-Tropical Plants, 393, 394.)

Piptadenia excelsa (Griseb.) Lillo. (Mimosaceae.) 43458. Seeds from Argentina. Collected by Mr. H. M. Curran. An unarmed tree, almost 100 feet high, with 15 to 20 pairs of leaflets in each leaf, and spikes of flowers two or three inches long. The pods are linear. The rather thin bark is not used in tanning as the other species. The rosy wood, which resembles that of *Piptadenia macrocarpa,* is tough and straight-

grained, and is used by the carpenters of Jujuy for various kinds of work. It is indigenous to the northern part of Argentina, and is not exported in the south. (Adapted from Grisebach, Plantae Lorentzianae, p. 121 as *Piptadenia communis excelsa*, and from Lillo, Contr. Arboles Argentina, p. 48.) Important timber trees and also planted as shade trees in Buenos Aires. (Curran.)

Piptadenia macrocarpa Bentham (Mimosaceae.) 43459. Seeds from Argentina. Collected by Mr. H. M. Curran. An unarmed tree, native of Brazil, with grayish tomentulose twigs and branches, and 10 to 25 pairs of pinnae, each with 20-40 pairs of pinnules, hardly two millimeters long. The flowers occur in peduncled heads in the axils of the leaves, sometimes at the ends of the branchlets. The pods are half a foot long and more, and an inch wide with thickened margins. (Adapted from Bentham, Hooker's Journal of Botany, vol. 4, p. 341, and from Bailey, Standard Cyclopedia of Horticulture, p. 2647.) Important timber trees and also planted as shade trees in Buenos Aires. (Curran.)

Prunus salicifolia H. B. K. (Amygdalaceae.) 43425. "**Cereza.** Seed of a wild cherry brought to the market of Mazatenango from the *tierra fria* or highlands. The fruit is one-half to five-eighths of an inch in diameter, sometimes round but more commonly oblate in form, shiny purplish black in color. In size and general appearance it closely approaches an English *Morello* cherry, though perhaps a trifle smaller. The flesh, which is dark colored and juicy, is rather meaty in texture, and has the flavor of the *Oxheart* cherry grown in the Western United States, with the addition of a trace of bitterness. The fruit is esteemed, and is used in several ways, principally as a fresh fruit and for the preparation of preserves. The tree is said to be medium sized, and to grow in the mountains some distance back from the coast, at a considerable elevation." (Wilson Popenoe.)

Pyrus chinensis x communis (Malaceae.) 43442. Plants grown at the Plant Introduction Field Station, Chico, California. Hybrid pear raised by Dr. W. Van Fleet, in 1907 and presented to the Plant Introduction Field Station, Dec. 22, 1909. "Fruit large and of attractive pyriform shape, somewhat resembling *Bartlett* but with a deep red cheek on yellow ground. Flesh fine grained, tender and juicy with but few granules, fla-

vor sweet and pleasant, quality very good. Should make an attractive market pear. It is hoped the usual resistance of Oriental pears to blight will be shown by this hybrid variety." (Dr. Van Fleet.)

Rubus sp. (Rosaceae.) 43438. Seeds of **Mora** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A wild species of Rubus which is common in the vicinity of San Lucas, an altitude of nearly 7000 feet. The plants greatly resemble the blackberry in habit, growing to a height of 6 or 7 feet. The fruit also resemble blackberries being about the same size, with the individual drupelets like those of the blackberry, but slightly lighter in color. The flavor is rather acid, suggesting both the blackberry and the loganberry. The fruit is gathered from the wild plants and brought by the Indians to the market of Guatemala City, where it is a common sight. It is used for preserves and for stewing." (Popenoe.)

Saccellium lanceolatum Humb. & Bonpl. (Boraginaceae.) 43460. Seed from Argentina. Collected by Mr. H. M. Curran. A tree, 2 to 4 m. in height, with many branches, and a trunk 3 dm. in thickness. The alternate, lanceolate leaves are 10 to 16 cm. in length, and the terminal racemes of inconspicuous dioecious flowers resemble minute bouquets. The fruit is a small drupe. The wood of this tree is about the same in color and texture as that of the ash (*Fraxinus excelsior*). This tree is found in the Peruvian Andes, on the tributaries of the river Guancabamba. (Adapted from Humboldt and Bonpland, Plantes Equinoxiales, pp. 41-44.)

Schinopsis lorentzii (Griseb.) Engler. (Anacardiaceae.) 43461. Seeds of **Quebracho** from Argentina. Collected by Mr. H. M. Curran. A tall, timber tree, native of central South America, attaining a height of 50-75 feet, and a diameter of two to four feet. The leaves are composed of 10-15 pairs of pinnae and the flowers occur in panicles. The fruit is a dry, indehiscent samara. The heartwood of this tree is one of the hardest, heaviest, and, in the region of its occurrence, most durable woods known. It contains a large amount of tanning, which acts as a preservative, and is used extensively for railroad ties, wharves, dry docks, fence posts, etc. The tannin of which the heartwood contains from 20 to 24 per cent, is a very important

product of this tree. The wood is whiter than that of *Quebracho colorado* of Chaco. (Adapted from Mell, Forestry Circular 202, on Quebracho Wood, and from Lillo, Contr. Arboles Argentina, p. 3.)

Sicana odorifera (Vell.) Naudin. (Cucurbitaceae.) 43427. Seeds from Mazatenango, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "A peculiar melon called here **melocoton** (peach). It is not commonly cultivated, and is only occasionally seen in the market. It is cylindrical, a foot in length, about four inches in diameter, with a smooth surface shining black in color. On cutting the melon in halves lengthwise, one finds a narrow zone of flesh next the skin, and the rest of the space occupied principally by seeds, which resemble considerably those of the watermelon. The flavor is rather strong, and suggests that of a canteloupe. Not to be recommended for cultivation as a comestible, but may be of interest to those studing the cucurbits." (Popenoe.)

Simaba cedron Planchon. (Simaroubaceae.) Seeds of **Cedron** from Cristobal, Canal Zone. Presented by Mr. O. W. Barrett. "Mr. Sandberg believes these nuts are high in tannic acid content and also possess some good medicinal qualities since they are used in several native remedies about here. The tree reaches some 15 to 25 feet in height and bears great quantities of these brownish fruits consisting of the large seed and a layer, 5 to 15 mm. thick, of reddish yellow flesh, bitter and acrid." (Barrett.) A short, erect, graceful tree with a trunk about six inches in diameter, and large, alternate, pinnate leaves, composed of 20 or more pairs of leaflets. The white flowers occur in long racemes, similar to those of *S. trichilioides*. The oval fruits, which are 6 cm. (2½ inches) long, are edible. A bitter principle is found throughout the plant, but only the seeds are used medicinally. These seeds are intensely bitter, and are used as a remedy for snake bite, hydrophobia, and in treating fevers and dysentery. If more than 25 or 30 grains are given in a single dose, death may result. This tree is found in Colombia, Panama, and Costa Rica. (Adapted from Heraud, Nouveau Dictionnaire des Plantes Medicinales, pp. 563-565, and from Planchon, in Hooker's Journal of Botany, vol. 5, p. 566.)

Viroa surinamensis (Rol.) (Myristicaceae.) 43424. Seeds of **Ucuuba** from Para, Brazil. Presented by Mr. George H. Pickerell, American Consul. "Myristicaceae are more important as timbers than the Annonaceae, in spite of being represented by a much smaller number of species, especially the two commonest species of the Amazon, *ucuuba branca* (*Virola surinamensis* Warb.) and *ucuuba vermelha* (*Virola sebifera* Aubl.) The first, especially, is one of the most useful trees of the Amazon region, not only for its easily worked wood, moderately hard, but also for its seeds, which furnish a kind of vegetable wax rich in stearin. While the *ucuuba branca* is found principally in the varzeas (probably meaning low, swampy valleys) it is not excluded from the terra firma (meaning dry ground); the *ucuuba vermelha,* which is distinguished by its larger leaves and smaller fruits, is a tree of the dry land and is found principally in the forests. Both these species have, especially when young, a characteristic manner of growth, with slender whorled branches furnished with regularly distichous leaves. The regularity of its branching reminds one of the European conifers. Without doubt other Amazonian species of Virola and probably also some species of Iryanthera furnish wood which could be utilized, but I have no positive knowledge in regard to this." (J. Huber, Mattas e Madeiras Amazonicas, Boletim de Museu Goeldi, vol. 6, p. 174, 1910.) The wood of this Brazilian tree is used for interior work and general carpentry. The bark is medicinal and the fruits contain 55 per cent of myristin, a waxy substance of the consistency of beef tallow, used in the trade for candles and soap. (Adapted from Correa, Flora do Brazil, pp. 70, 71.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in Charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent, Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY
COLLEGE OF AGRICULTURE
UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 127. NOVEMBER, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acer	1075	Kalanchoe	1078
Annona	1075	Lespedeza	1078
Campylotropis	1076	Lonicera	1078, 1079
Cassia	1076	Montanoa	1079
Cordia.	1076	Persea	1079
Cotoneaster	1077	Rosa	1083, 1084
Euonymus	1077	Schinopsis	1085
Feroniella	1077	Solanum	1085
Hydrangea	1077	Viburnum	1085, 1086
Hypericum	1078		

Plates:

Pl. 207. Dried mulberries from Afghanistan, *Morus alba.*
208. A new fruiting vine from Manila, *Tetrastigma harmandi* Planchon.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS in which are described the plants ready for sending out.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

April 14, 1917.

Anyone desiring to publish any portion of this circular should obtain permission by applying to this Office.

Acer argutum Maximowicz. (Aceraceae.) 43676. Seeds of a **maple** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A small deciduous maple, with erect branches, and doubly serrate leaves from 2 to 4 inches in length. The greenish-yellow flowers are produced in April before the leaves, and the keys are born in hanging racemes. This tree is a native of the mountain woods of Japan, and makes an elegant appearance, with its pale green leaves in summer and its purplish brown branches in winter. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 135.)

Annona cherimola Miller. (Annonaceae.) 43485. From Duenas, Depto. Sacatepequez, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Budwood of an unusually choice variety of **cherimoya,** or *anona* as it is called here, from a garden in the village of Duenas, about 10 kilometers from Antigua. The cherimoya is very common in this region, which lies at an elevation of about 5200 feet. There is great variation in the shape and character of the fruit, and the trees seem to vary in productiveness. Most of them bear very few fruits. The tree from which this budwood was taken has a trunk about a foot in diameter, but at a distance of ten feet from the ground the top has been removed, probably two years ago, and the sprouts which are to form the new top are now about 6 feet long. There are a good number of these sprouts and they are now in bearing, producing, altogether, more fruit than is usually borne by the ordinary tree of mature size, which has a crown 10 to 20 feet broad, and a vastly greater amount of fruiting wood. Whether the productiveness of this variety is an inherent characteristic, or whether it has been induced by topping the tree, I am unable to determine, but on the chance that it may be inherently a heavy bearer I have secured budwood for propagation and trial in Florida and more especially in southern California, where cherimoya culture could undoubtedly be developed into a horticultural industry if prolific and otherwise desirable varieties were obtainable. The fruit of this variety is of good size and excellent appearance. It varies from 3 to 7 inches in length, and from about 6 ounces to nearly 3 pounds in weight. In form it is uniformly conical, blunt at the apex and the surface is nearly smooth, the carpellary areas being indicated by raised lines.

The color is light green. The fruit begins to ripen about the first of October, but the season is not at its height until after the end of the year. Many of the fruits are attacked by an insect which burrows in the seeds. Its presence can be detected by small round holes on the surface of the fruit." (Popenoe.)

Campylotropis macrocarpa (Bunge) Rehder. (Fabaceae.) 43679. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A shrub, up to 6 feet in height, with long-stalked leaves and oval leaflets. The purple flowers appear in many-flowered racemes about 3 inches long, and the glabrous pods are more than ½ inch long. This shrub is found in northern and central China. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 1845, under *Lespedeza macrocarpa.*)

Cassia eremophila A. Cunningham. (Caesalpiniaceae.) 43650. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A woody plant, found in Australia, in all the colonies except Tasmania. The leaves are composed of two pairs of very narrow leaflets, and the pods are very smooth. In Australia both the pods and the leaves of this plant are eaten by stock. (Adapted from Maiden, Useful Native Plants of Australia, p. 47, under *Cassia nemophila.*)

Cordia myxa L. (Boraginaceae.) 43654. Seeds of **Sebesten** from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A moderate-sized deciduous tree, found in tropical Asia and Australia, with oval leaves and thick, rough bark. The wood is soft, and is said to have furnished the wood from which the Egyptian mummy cases were made. In India it is used for boat-building, gun stocks and agricultural implements; it is an excellent fuel. The fibrous bark is made into ropes, and is used for caulking boats. The fruits are succulent and mucilaginous, and when young these are eaten as vegetables, and also pickled. They have also been employed as pectoral medicines. (Adapted from Maiden, Useful Native Plants of Australia, pp. 19, 165, 407, 620, 639, and from Gamble, Manual of India Timbers, p. 270.)

Cotoneaster horizontalis perpusilla Schneider. (Malaceae.) 43682. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr W. Van Fleet, of this Department. A low Chinese shrub, with the branches almost horizontal, and roundish oval leaves, less than 1/3 inch long. The flowers are erect and pink, and the bright red, ovoid fruit has usually 3 seeds. This variety differs from the typical species in having smaller leaves and fruits. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 865.)

Euonymus yedoensis Koehne. (Celastraceae.) 43688. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A deciduous shrub or small tree, growing 10 feet or more high, with pinkish purple fruit. This shrub is a native of Japan, and in autumn its leaves turn a brilliant red. (Adapted from W. J. Bean, Trees and Shrubs, Hardy in the British Isles, vol. 1, p. 543.)

Feroniella oblata Swingle. (Rutaceae.) 43566. Seeds from Saigon, Cochin-China. Presented by Mr. P. Morange, Director, Agricultural and Commercial Services. A spiny tree, 25 to 65 feet in height, native of Cambodia and Cochin China, growing rather commonly in forests, both in the plains and on the mountains. The leaflets of the pinnate leaves are oval with rounded or flattened tips, and the very fragrant, white flowers appear in many-flowered panicles, growing on the branches of the previous year's growth. The fruits are borne in clusters of 3 or 4, are shaped like a flattened sphere, and are from 2 to 2½ inches in diameter. The pulp is edible, sub-acid and pinkish, has a pronounced orange flavor when young, and is used as a condiment in sauces. (Adapted from Swingle, in Bailey, Standard Cyclopedia of Horticulture, pp. 1219, 1220.)

Hydrangea xanthoneura Diels. (Hydrangeaceae.) 43690. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A deciduous shrub, about 8 feet in height, of a loose straggling habit. The leaves, dark green above and pale beneath, are in threes and of an oval shape. The creamy white sterile flowers are in flattish panicles of a width of about 6 inches, and the perfect flowers are dull

white and ¼ inch wide. This is a native of central China. (Adapted from W. J. Bean, Trees and Shrubs, Hardy in the British Isles, vol. 1, 631.)

Hypericum patulum henryi Bean. (Hypericaceae.) 43692. Seeds of **St.-John's-wort** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A hardy evergreen shrub, native of northern India and the Himalayas, with very large dark green leaves and large handsome yellow flowers. (Adapted from Curtis's Botanical Magazine, plate 4949. See also S.P.I. No. 38153 for further data.)

Kalanchoe marmorata Baker. (Crassulaceae.) 43658. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A very stout, low branching shrub, native of Abyssinia, where it grows in the mountains. The oval, succulent leaves are pale green, blotched with purple; the young leaves are orange-green with blood-red spots; all of the leaves are crenate. The creamy-white flowers are in large compound panicles, and the individual flowers are more than two inches long. (Adapted from Gardener's Chronicle, vol. 12, Sept. 10, 1892, and from Curtis's Botanical Magazine, plate 7333.)

Lespedeza formosa (Vogel) Koehne. (Fabaceae.) 43693. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. An herb, or in warm regions a shrub up to 2 meters high, throwing up strong, wiry shoots each year from the crown. The stems are hairy, angled, reddish or brown, and the rosy purple flowers, nearly ½ inch long, occur in very numerous long, drooping racemes. The pod is about ½ inch long and pubescent. This plant, which is a native of Japan and China, is a very desirable late bloomer. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 1845, under *L. sieboldii.*)

Lonicera maackii erubescens Rehder. (Caprifoliaceae.) 43698. Seeds of **honeysuckle** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A rather low, spreading shrub, with broadly oval leaves which are dark green above and paler beneath. The white flowers are large and tinted with pink, and

Readers are requested to insert on p. 1079, after "red" at the beginning of the 12th line, the following lines which give the remainder of that description and the beginning of the next one: "This shrub, which is a native of central China, is most beautiful in the fall, for the dark green foliage and the black fruits last until November. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, p. 1910.)

Malus arnoldiana Rehder. (Malaceae.) 43700. Plants of a hybrid **apple** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department."

beautiful pink, and it is considered by some persons to be the most beautiful of the crabapples. (Adapted from Arnold Arboretum, Bulletin of Popular Information, Nos. 3, 1911, and 39, 1913.)

Montanoa hibiscifolia (Benth.) C. Koch. (Asteraceae.) 43660. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. One of the **tree-daisies** of Central America which is easily distinguished by its 5 to 7 lobed leaves, which are opposite and entire. It is easily cultivated, the seeds being started indoors, and the plants transferred to the open for foliage effects. It may also be propagated by cuttings. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 2064, and from Koch, Wochenschrift des Vereines zur Beforderung des Gartenbaues, vol. 7, p. 407.)

Persea americana Miller. (Lauraceae.) 43486. Budwood of **avocado** from Santa Maria de Jesus, Depto. Sacatepequez, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "From the garden of an Indian, who refused to divulge his name. The garden is in the center of the village, toward the Volcan de Agua from the central plaza. Santa Maria de Jesus is a small village located upon the upper slopes of the Volcan de Agua, at an elevation (according to my barometer) of 6700 feet. It is about 10 kilometers from Anti-

succulent leaves are pale green, blotched with purple; the young leaves are orange-green with blood-red spots; all of the leaves are crenate. The creamy-white flowers are in large compound panicles, and the individual flowers are more than two inches long. (Adapted from Gardener's Chronicle, vol. 12, Sept. 10, 1892, and from Curtis's Botanical Magazine, plate 7333.)

Lespedeza formosa (Vogel) Koehne. (Fabaceae.) 43693. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. An herb, or in warm regions a shrub up to 2 meters high, throwing up strong, wiry shoots each year from the crown. The stems are hairy, angled, reddish or brown, and the rosy purple flowers, nearly ½ inch long, occur in very numerous long, drooping racemes. The pod is about ½ inch long and pubescent. This plant, which is a native of Japan and China, is a very desirable late bloomer. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 1845, under *L. sieboldii.*)

Lonicera maackii erubescens Rehder. (Caprifoliaceae.) 43698. Seeds of **honeysuckle** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A rather low, spreading shrub, with broadly oval leaves which are dark green above and paler beneath. The white flowers are large and tinted with pink, and

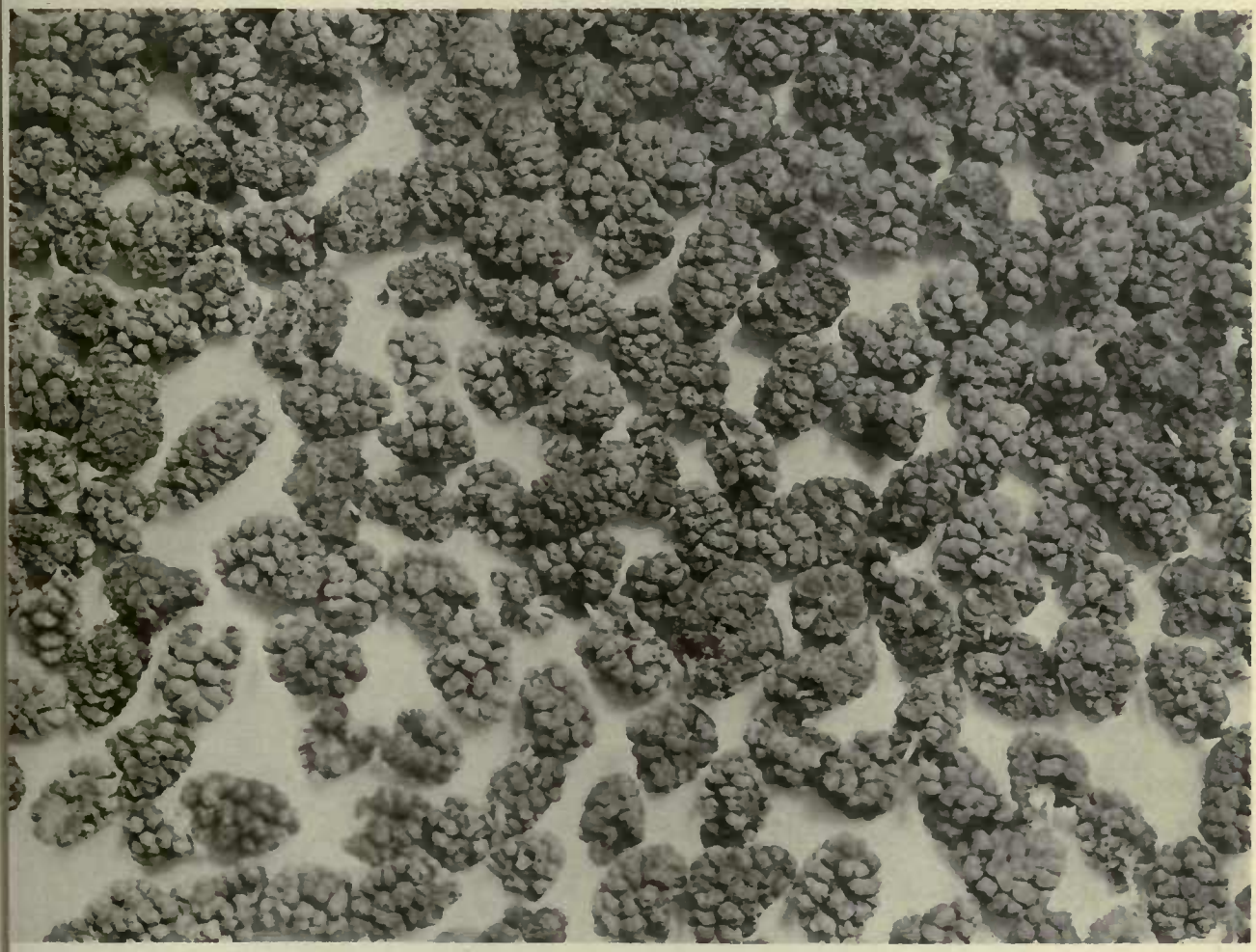
the fruit is dark red. This variety is found in central China. A very desirable late bloomer. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, p. 1910.)

Lonicera maackii podocarpa Franchet. (Caprifoliaceae.) 43699. Seeds of **honeysuckle** from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A low, spreading shrub, with broadly oval, short-tipped dark green leaves. The flowers are white, fading to yellowish, and the fruit is dark red. This is a hybrid of *Malus floribunda* with one of the hybrids of *Malus baccata*, and appeared spontaneously in the Arnold Arboretum several years ago. It makes a smaller tree than *M. floribunda*, but its long spreading and arching branches are very graceful, and the flowers produced on long stems are more than twice as large as those of *M. floribunda*. These flowers are a beautiful pink, and it is considered by some persons to be the most beautiful of the crabapples. (Adapted from Arnold Arboretum, Bulletin of Popular Information, Nos. 3, 1911, and 39, 1913.)

Montanoa hibiscifolia (Benth.) C. Koch. (Asteraceae.) 43660. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. One of the **tree-daisies** of Central America which is easily distinguished by its 5 to 7 lobed leaves, which are opposite and entire. It is easily cultivated, the seeds being started indoors, and the plants transferred to the open for foliage effects. It may also be propagated by cuttings. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 2064, and from Koch, Wochenschrift des Vereines zur Beforderung des Gartenbaues, vol. 7, p. 407.)

Persea americana Miller. (Lauraceae.) 43486. Budwood of **avocado** from Santa Maria de Jesus, Depto. Sacatepequez, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "From the garden of an Indian, who refused to divulge his name. The garden is in the center of the village, toward the Volcan de Agua from the central plaza. Santa Maria de Jesus is a small village located upon the upper slopes of the Volcan de Agua, at an elevation (according to my barometer) of 6700 feet. It is about 10 kilometers from Anti-

gua. As one climbs up the broad slope of the volcano the character of the vegetation changes considerably, and many of the plants common in gardens at Antigua are not grown here because of the cold. Among the plants which are conspicuous by their absence are the banana, the orange (and other citrus fruits), and the tender ornamental plants, such as the royal palm. In their stead, the gardens of the Indians at Santa Maria are filled with peach trees, chayote vines, granadilla vines (*Passiflora ligularis*), and vegetables such as peas. The hardy Abyssinian banana is a common ornamental plant. Among the plants of the lower elevations which persist are the cherimoya, the avocado, and the matasano (*Casimiora*), though I only saw one tree of the latter. *Grevillea robusta* is one of the commonest ornamental trees. It can thus be seen that the vegetation is not at all tropical in character, and it must get quite cold in winter. The Commandant assures me that it goes below freezing, but figures are lacking. This avocado has been obtained in the hope that it may prove hardier than those from lower elevations, and thus of value farther north in Florida than the majority of varieties can be grown. In California it may succeed in regions which are a trifle too cold for the average Guatemalan variety. It should at least be given a test with this in view. The fruit is not yet fully grown, so it cannot be fully described. The tree is about 25 feet high, and is carrying a fair crop of fruit. It has good large wood and seems to be a stronger grower than some I have seen. The fruits are almost round, tending toward broadly obovoid, and obscurely ribbed. The surface is very light green, almost glossy, with numerous large yellowish dots. The skin is slightly over one-sixteenth inch thick, and the seed is very small in comparison with the size of the fruit. It looks like a good avocado. The season of ripening could not be ascertained, but probably is not earlier than April." 43487. "From the garden of an Indian, near the center of the village, to the west of the church. This village is situated on the road between Guatemala City and Antigua, at an elevation of 6850 feet, (according to my barometer.) The principal fruit trees in the garden of the Indians are peaches, cherimoyas, avocados, quinces, manzanillas (*hawthorns*), and pomegranates. There are are no bananas here, and I only saw two or three orange trees. The tropical fruits do not succeed at this elevation. The variety like 43486 has been selected because of its



DRIED MULBERRIES FROM AFGHANISTAN, MORUS ALBA.

These dried mulberries were presented by His Majesty the Ameer of Afghanistan to the Department of Agriculture through his official representative, Mr. A. C. Jewett. They are practically, but not quite, seedless and extremely palatable. Analysis showed them to have about the food value of dried figs. According to Mr. Jewett they form almost the exclusive food of hundreds of thousands of Afghans for several months each year. Photographed (P15747FS) by E. L. Crandall, April 6, 1915.

TETRASTIGMA, A NEW FRUITING VINE FROM MANILA, TETRASTIGMA HARMANDI PLANCHON, S. P. I. No. 34630.

This vine has made a remarkable growth at the Davie Experimental Farm on the Everglades, where it was first planted out July 9, 1914. It is described by Mr. C. F. Baker as a tall-growing woody vine which becomes loaded with fruit of the size and appearance of the Scuppernong grape and which is edible, making a very good refresco. It flowered in 1915, but did not fruit and seems to have been unaffected by the floods produced by 17 inches of rain which fell in less than three days. Photographed (P20010FS) by David Fairchild, February 6, 1916.

possible hardiness. Coming from an elevation about 1750 feet above Antigua, it may prove to be more frost resistant than varieties from the latter place, and it should be given a trial in localities in California and Florida which are thought to be slightly too cold for the average variety of this type. The tree is about 20 feet high, with a good crown. According to the owner, it bears over 200 fruits in good seasons, but sometimes the crop is partly destroyed by frost. The last of the fruits of this year's crop are now being picked. It seems to ripen later than most of the trees in Antigua, but this may be due to the difference in elevation. The fruit is of good size and quality, oblong-oval, weighing up to a pound, deep green in color, with flesh of good flavor and a seed slightly large in size, tight in the cavity. Form truncate oval; size medium to above medium, weight 10 to 16 ounces, length $3\frac{3}{8}$ to $3\frac{7}{8}$ inches, greatest breadth 3 to $3\frac{5}{8}$ inches; base obliquely flattened, the stem inserted to one side in a shallow cavity; stem very stout, about 4 inches long; apex truncate to rounded, the stigmatic point slightly raised; surface pebbled or slightly rough, dull deep green in color, with few yellowish dots and numerous rough russet scars; skin one-sixteenth inch thick at base, slightly thicker at apex of fruit, coarsely granular, separating readily, brittle; flesh firm, oily, rich yellow near the seed, changing to pale green near the skin, very slightly discolored around the base of the seed with fiber traces; flavor very rich, nutty; quality very good; seed medium to rather large in size, oblate-conic in form, $1\frac{5}{8}$ to 2 inches broad, tight in the cavity, with both seed coats adhering closely." 43560. "From the garden of Victor Garcia, who keeps a small cantina on the road from Antigua to San Antonia Aguas Calientes, just above the church at San Lorenzo del Cubo. After two weeks search in the Antigua region, this is the best early variety I have been able to find. There are practically no avocados in the Antigua market at the present time; here and there one finds a tree which ripens its fruits this early, but most of them are large-seeded. At lower elevations than this there are more trees which ripen their fruits in October, but here at 5000 feet there are exceedingly few. This variety is small, but I believe it will be found that the size is amply large enough where it is desired to serve a half fruit as a portion. The seed

is very small in proportion to the size of the fruit, rather a rare thing in an avocado of round or oblate form, for as a rule fruits of this shape have large seeds. The skin is thick, and the flesh clear, of good color and texture and the quality is good for an early fruit. An early variety of the Guatemalan type is much needed for California, since none of the varieties so far tested in that state ripen in time for the holiday season. The tree from which this budwood was taken stands on a rather steep hillside, the soil being a loose sandy loam. The trunk of the tree is about a foot and a half thick, and the crown spreading, 35 feet in diameter and about the same in height. The foliage is rather scanty, especially so at the present time, as the tree is coming into flower. The crop of fruit is enormous; it is impossible to make an accurate count, but the number of fruits is certainly well above 1000 and may be nearer 2000. Next year it will probably bear a comparatively small crop, for according to the avocado growers of the Antigua region, practically all of the trees bear a heavy crop one season followed by a very light one the next. With good culture the fruits would probably be larger than they are on this tree; it seems reasonable to expect that they will weigh 12 ounces. Fruit roundish oblate, size below medium, weight 8 to 10 ozs., length $2\frac{3}{4}$ to 3 inches, greatest breadth 3 to $3\frac{1}{4}$ inches, base truncate, the stem inserted squarely without depression; stem fairly stout, 4 inches long; apex flattened, sometimes slightly oblique; surface pebbled dull purple in color, with numerous small yellowish dots, skin one sixteenth inch thick at basal end of fruit, about one eighth inch at apex, separating readily from the flesh, rather finely granular, brittle; flesh deep cream yellow near seed, changing to very pale green near skin, quite free from fiber discoloration, firm in texture and moderately rich in flavor; seed small in comparison to size of fruit, oblate, 1 5/8 inch broad, $1\frac{1}{4}$ inch long, tight in the seed cavity with both seed coats adhering closely. Season at San Lorenzo del Cubo commencing about the middle of October, but not all the fruits are mature until several weeks later. This variety is particularly recommended for trial in the avocado districts of California, where a variety which will mature early in the winter is much needed. It may not ripen quite so early in California as it does in Guatemala, due to the difference in climatic conditions." 43602. "From the patio in the

rear of the Masonic building, 7a Avenida Norte No. 4, Guatemala City, Guatemala. The altitude here is approximately 4900 feet. This tree has been mentioned by several people as producing the finest fruit which they have ever eaten. Don Pedro Bruni, who has lived in Guatemala many years, and is thoroughly familiar with avocados, tells me that he has never eaten a fruit of better quality than this. The tree is very large, standing at least 50 feet high, with a trunk about two feet in diameter. Its age is unknown, but it is probably 50 or 75 years at least. It has a dense crown, and seems to be in vigorous condition. As is commonly the case with avocados of the Guatemalan type, the tree does not appear to produce a large crop of fruit every season. It bore well last year, but is not fruiting at all this year, hence it has not been possible to examine the fruit. The caretaker on the property described it as being pear-shaped, medium sized (probably about a pound in weight or perhaps a trifle more), and deep purple in color when ripe. The seed is said to be small or medium sized, and the flesh rich yellow in color, of unusually rich flavor. It is difficult to ascertain the length of the season, but the fruit is said to be at its best from May to July. The tree is said to bear heavy crops in some seasons, and the fact that it is not bearing this year is not against the variety, since this is the habit of a great many trees of this type; it seems, in fact, to be the rule. Although I have not been able to examine this fruit personally, it seems well worthy of trial in California and Florida on the strength of the recommendation given it by the people here." (Popenoe.)

Rosa abietina Grenier. (Rosaceae.) 43706. **Rose** hips from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A shrub with slender, often climbing brown stems, becoming 10 feet high, and usually armed with straight prickles. The leaves are composed of 5 to 9 leaflets, which are dark green, and the bright yellow flowers occur singly or several at a time. The flowers are from 2 to 2½ inches wide, and have a very unpleasant odor. The fruit is round. This rose is a native of western Asia. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, p. 2995, under *Rosa foetida*.)

Rosa ferox Bieberstein. (Rosaceae.) 43714. Rose hips from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A dwarf, compact little bush, from 1 to 2 feet high, of a rounded form, with numerous decurved prickles. The leaves are composed of 5 to 7 leaflets, coarsely but evenly serrate and the white flowers, which are either solitary or in clusters of two or three, are from 1 to 1¼ inches long. The roundish fruit is red. This is a native of the Crimea and Caucasus. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 426.)

Rosa lheritieranea Thory. (Rosaceae.) 43718. Rose hips from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. This is supposed to be a hybrid between *R. pendulina* and *R. chinensis*, and climbs to a height of 12 feet, with slender, sparingly prickly branches. The leaves are composed of 3 to 7 leaflets, and the purple flowers, which vary with lighter and darker shades, and are double or semi-double, occur very plentifully in nodding corymbs. (Adapted from Rehder, in Bailey Standard Cyclopedia of Horticulture, p. 2993.)

Rosa moyesii Hemsl. & Wilson. (Rosaceae.) 43588. Cuttings of rose from Kew, England. Presented by Mr. W. Watson, Curator, Royal Botanic Gardens. A shrub, 6 to 10 feet in height, with erect stems armed with stout, pale, broad-based prickles. The leaves are from 3 to 6 inches long, and are composed of 7 to 13 leaflets, which are dark green above and pale glaucous below. The flowers, which occur solitary or in pairs, are a lurid dark red, and from 2 to 2½ inches in width. The red, bottle-shaped fruit is 1½ inch or more long, with a distinct neck between the body of the fruit and the persistent sepals. This rose is a native of western China, and was first found on the frontier of Tibet, at an altitude of 9000 feet and over. It is perfectly hardy in the British Isles, and is remarkable for the color of its petals. (Adapted from W. J. Bean, Trees and Shrubs Hardy the British Isles, vol. 2, p. 435.)

Rosa prattii Hemsley. (Rosaceae.) 43723. Rose hips from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W.

Van Fleet, of this Department. A slender-branched shrub, up to 8 feet in height, with numerous bristles and slender prickles. The leaves are composed of 7 to 15 obtuse, serrate leaflets, and the pink flowers, which occur 1 to 3 in a cluster, are three-fourths inch wide. The scarlet fruit is about one-third inch long. This rose is a native of western China. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, p. 2998.)

Schinopsis lorentzii (Griseb.) Engler. (Anacardiaceae.) 43548. Seeds of **quebracho colorado** from Buenos Aires, Argentina. Received through the Bureau of Chemistry, from the Food Research Laboratory, Philadelphia, who secured it from the Director of the Botanical Gardens, Buenos Aires. "Red Quebracho. Tree of very hard wood, with compound, coriaceous leaves; flowers borne in branching clusters, fruit a samara. It is one of the Argentine woods which, exposed to the air, buried in part or wholly or submerged in water keeps for 25 years in good condition as is shown by the tests made with posts, beams, ties, etc., laid by the Argentina railways. The products which are obtained from this tree constitute the principal source of income of the people where it grows. From the logs are manufactured beams, ties, telegraph posts, lamp posts, etc., which are exported in large quantities to foreign countries. The charcoal is very compact; and the extract (tannin) is an important product. The sawdust is very much used intanning." (Carrasco.)

Solanum melongena L. (Solanaceae.) 43636. Seeds of **egg-plant** from Westfield, New Jersey. Presented by Dr. R. S. Keeler. "The Japanese egg-plant of the long-fruit variety, grown from seed in my own garden at Westfield, New Jersey, from seed imported from Japan. This variety of egg plant is very fruitful and possesses fine keeping qualities. In fact, I still have some of them on hand and find them very good eating, although they were picked from the garden five weeks ago, after having been exposed to four or five rather severe frosts and a temperature as low as 36 degrees." (Keeler.)

Viburnum burejaeticum Regel & Herd. (Caprifoliaceae.) 43730. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this department. A shrub, 4

to 10 feet high, native of Chosen. The small, light green leaves and the small umbels of white flowers, followed by the jet black berries, make this plant very ornamental. (Adapted from note of F. N. Meyer.)

Viburnum sargentii Koehne. (Caprifoliaceae.) 43734. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A shrub, growing to a height of from 5 to 8 feet, with roundish leaves, and flowers in flat corymbs. The rounded fruits are scarlet or orange-scarlet, and ripen in September. (Adapted from Florists' Exchange.)

Viburnum theiferum Rehder. (Caprifoliaceae.) 43735. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A decidous shrub of erect habit, up to 12 feet in height, with smooth gray stems. The narrowly oval leaves are sharply serrate, taper-pointed, and dark green above. The white flowers are all perfect, and are produced in terminal cymes 1½ to 2 inches in with. The red fruit is egg-shaped and nearly ½ inch long. This shrub is a native of central and western China. The specific name refers to the use of the leaves by the monks of Mount Omei as a kind of tea. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 657.)

Viburnum wrightii Miquel. (Caprifoliaceae.) 43736. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum and selected by Mr. H. C. Skeels and Dr. W. Van Fleet, of this Department. A deciduous shrub, 6 to 10 feet high, with erect stems. The bright green leaves are 2 to 5 inches in length, and are slenderly pointed. The white flowers are all perfect, and are produced in May on smooth or downy-stalked, five-rayed cymes, 2 to 4 inches in width. The roundish oval red fruits are 1/3 inch long. This shrub is a native of Japan and China. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 660.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
David A. Bisset, Nathan Menderson and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Goucher, Propagator.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. H. T. Edwards, Ridgewood, N. J.
Dr. Gustav Eisen, California Academy of Sciences, San Francisco, Calif.
Mr. E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. E. J. Kraus, University of Chicago, Chicago, Ill.
Mr. Barbour Lathrop, Chicago, Ill.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

FORESTRY

PLANT IMMIGRANTS

No. 128. DECEMBER, 1916.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acer	1089	Larix	1094
Achradelpha	1089	Malus	1094
Aeschynomene	1089	Moringa	1094
Berberis	1090, 1091	Persea	1094, 1095
Betula	1091		1101-03
Bignonia	1091	Populus	1097
Bridelia	1091	Pyrus	1097
Carya	1091	Rosa	1098, 1099
Castanea	1092	Syringa	1099
Clematis	1092	Tipuana	1099
Corchorus	1092	Tristania	1099
Cotoneaster	1093	Ulmus	1100
Decumaria	1093	Wistaria	1100
Enkianthus	1093	Zea	1100
Indigofera	1093		

Plates:

Pl. 209. A century-old White Sapote tree at Santa Barbara, Cal., *Casimiroa edulis.*

210. Fruits of the White Sapote, *Casimiroa edulis.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

July 6, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acer tetramerum Pax. (Aceraceae.) 43813. Plants of **maple** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A tree from central and western China, with oval or oblong leaves from 2 to 3½ inches long, and staminate flowers in few-flowered sessile racemes. The keys are slender-stalked and the nutlets are thick and strongly veined. It is graceful and hardy, and very variable, and reaches a height of 25 feet. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 202.)

Achradelpha viridis (Pittier) O. F. Cook. (Sapotaceae.) 43788. Seeds of **injerto** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Fifty seeds from fruits purchased in the market of Guatemala City. The injerto is a common tree in this part of Guatemala. Unlike its near relative, the sapota (*Lucuma mammosa*), which seems to thrive only at compartively low elevations in the tropics, the injerto is grown as high as 5000 or 6000 feet, and should, therefore, stand a better chance of succeeding in California and Florida than the sapote, which has, so far, been a failure in those states. The tree grows to a height of about 40 feet in this region, and has long slender leaves suggesting those of the sapote. The fruits vary somewhat in shape, but are commonly round to oval, often pointed at the tip. They are two to three and a half inches in diameter, smooth, dull yellow-green in color, sometimes becoming almost dull yellow. The skin is not thick, and adheres closely to the flesh, which is red brown in color, soft and melting, sweet, with a pleasant flavor, somewhat resembling that of the sapote, but better. The large seed (sometimes there are two) is hard and polished, deep brown in color, and is easily removed from the pulp." (Popenoe.)

Aeschynomene elaphroxylon (Guill. & Perr.) (Fabaceae.) 43767. Seeds of **ambach** from Cairo, Egypt. Presented by the Director, Horticultural Division, Minister of Agriculture, Giza Branch. A leguminous tree, with compound leaves and yellow flowers, found growing in many places in tropical Africa. The hairy pods are often sickle-shaped, with two or more joints. When in flower this tree is very ornamental. The wood is exceedingly light, strong, and durable, and is used by the natives for making small boats and rafts. It might be commercially used for paper pulp. (Adapted

from Kew, Bulletin Miscellaneous Information, Additional Series 9, pp. 199, 200, under *Herminiera elaphroxylon*, and from Engler & Prantl, Naturlichen Pflanzenfamilien, III.3, p. 319.)

Berberis brachypoda Maximowicz. (Berberidaceae.) 43818. Plants of **barberry** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A bush from western China, 4 to 7 feet high, with 3-parted spines, oval serrate leaves, yellow flowers in long slender panicles, and scarlet fruit which are up to ½ inch in diameter. In its native country this barberry grows at elevations of 5200 to 11700 feet. (Adapted from Sargent, Plantae Wilsonianae, part 1, p. 375, 1913, and from Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 2, p. 922.)

Berberis diaphana circumserrata Schneider. (Berberidaceae.) 43819. Plants of a **barberry** from Jamaica Plain, Mass. Originally from the Tai-pei-shan, Shensi, China. Presented by the Arnold Arboretum. A bush from central China, up to 7 feet high, with roundish oval leaves with very numerous and slender spine-tipped serrations. The spines are 3-parted, about ½ inch long, and the bright yellow flowers, ½ inch wide are solitary or in twos or threes on a common stalk. The scarlet fruits are oblong, with slightly bloom, and nearly ½ inch long. In autumn the leaves turn scarlet. Differs from the common barberry in its few flowers and large fruits. (Adapted from Sargent, Plantae Wilsonianae, vol. 1, part 3, p. 354, and from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 491.)

Berberis poiretii Schneider. (Berberidaceae.) 43821. **Barberry** plants from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A shrub found in northern China and Amurland, with slender, arching branches and spines about 1/3 inch long. The leaves are entire, narrowly lance-shaped, about an inch long and green beneath. The yellow flowers occur in many-flowered racemes from 1 to 2 inches long, and the deep blood-red fruits are oval-oblong. It is hardy and handsome, but is not often found in cultivation. Differs from the ordinary barberry in its entire leaves and blood-red fruit. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol 1, p. 490.)

Berberis sargentiana Schneider. (Berberidaceae.) 43823. Cuttings of **barberry** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A black-berried barberry from western Hupeh, China, reaching a height of 7 feet. It is the only evergreen barberry which has proved entirely hardy at the Arnold Arboretum. (Adapted from Sargent, Plantae Wilsonianae, vol. 1, p. 359.)

Betula schmidtii Regel. (Betulaceae.) 43828. Plants of a **birch** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A large tree with thick branches, found only in the province of Shimotsuke, Hondo, Japan. It grows to be 65 feet tall, with a trunk 3½ to 7½ feet thick, and black bark which falls off in thick, rather small plates. The finely serrate leaves are short-stemmed, and the catkins are narrow, stiff and erect. (Adapted from Sargent, Plantae Wilsonianae, vol. 2, part 3, pp. 475, 476.)

Bignonia unguis-cati L. (Bignoniaceae.) 43769. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A woody climber, with compound, evergreen leaves and trumpet-shaped, orange-yellow flowers about 2 inches long. This plant, which is a native of Argentina, will stand a little frost if grown in the open in the southern United States, and is conspicuous and interesting because of the beauty and profusion of its flowers. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 502.)

Bridelia retusa (L.) Sprengel. (Euphorbiaceae.) 43759. Seeds from Matania El Saff, Egypt. Presented by Mr. Alfred Bircher, Middle-Egypt Botanic Station. "A small Indian tree which grows in every kind of soil. It flowers in November and the black berries hanging in long racemes ripen early in spring. There is not much pulp on them but they might enhance by continuous culture. A sauce can be prepared with the dry fruits." (Bircher.)

Carya cathayensis Sargent. (Juglandaceae.) 43952. Nuts of **hickory** from Hangchow, China. Presented by Dr. D. Duncan Main. The only hickory so far found in China, discovered by Mr. Frank N. Meyer in the summer of 1915; a tall tree, 40 to 65 feet high, with grayish bark, and leaves composed of 5 to 7 lance-shaped or oval leaflets with the upper surfaces soft green

and the lower rusty brown. The nuts, which are thick-shelled and elliptic in shape, are collected and sold as a sweetmeat, and a fine clear yellow oil is extracted from them and used in fancy pastry. The wood is tough and strong and is used for tool handles. The tree thrives best at the foot of the mountains in narrow moist valleys, becomes crippled when exposed to much wind, and cannot stand much frost. (Adapted from Sargent, Plantae Wilsonianae, vol. 3, part 1, pp. 187, 188, 1916.)

Castanea vilmoriniana Dode. (Fagaceae.) 43832. Cuttings of **chestnut** from Jamica Plain, Mass. Presented by the Arnold Arboretum. A tree from 50 to 65 feet in height, found in the province of Shantung, China. It is closely related to the common American **chinkapin**, but has larger dimensions throughout, including the nuts, which are edible. (Adapted from Dode, Notes Dendrologiques, in Bulletin de la Société Dendrologique de France, No. 6, pp. 156, 157, 1908.)

Clematis tangutica (Maxim.) Korsh. (Ranunculaceae.) 43833. Plants from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A deciduous woody climbing plant from central Asia growing 8 to 10 feet high, with raggedly serrate gray-green leaflets. The rich yellow flowers are solitary, and the fruits are crowned with long feathered styles. This is said to be the handsomest yellow-flowered clematis in cultivation, the flowers sometimes being 4 inches wide. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 367.)

Corchorus capsularis L. (Tiliaceae.) 43808. Seeds of **jute** from Amoy, China. Presented by Messrs. E. F. Spears & Sons, Paris, Kentucky, who received it from Mr. Chan Goan Sin, Amoy. "Jute is an annual plant, requiring a rich, moist, but well-drained, alluvial soil and a warm moist climate, free from frost for at least six months. It will grow in sandy-loam alluvial soils from Maryland to Florida and Texas, but will not ripen much seed north of the cotton belt. The seed is sown broadcast, the crop harvested by hand, retted in water, and the fiber cleaned by hand from the wet stalks in the water. It could be grown profitably in this country if there were satisfactory methods for removing the fiber from the stalk and preparing it for market. The fiber is used for burlaps, bagging and gunny sacks." (L. H. Dewey.)

Cotoneaster bullata floribunda (Stapf) Rehder & Wilson. (Malaceae.) 43836. Plant from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A shrub, with oval or narrower dark green bullate leaves, up to 3 inches in length. The flowers are white tinged with pink, but are of little ornamental value because they fall off soon after appearing, and do not attain much size. The globose red fruits occur abundantly in September on the upper sides of the long arching shoots, and give the plant a very beautiful appearance. This shrub is found in western China. (Adapted from Curtis's Botanical Magazine, vol. 135, plate 8284, under *Cotoneaster moupinensis floribunda.*)

Decumaria sinensis Oliver. (Hydrangeaceae.) 43839. Plant from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A climbing shrub from Central China with generally oblong or obtuse leaves up to 3 inches in length, and small white flowers in terminal corymbs. The fruit is a capsule filled with numerous minute seeds. This shrub is very ornamental because of its handsome glossy foliage and the white flowers are very fragrant. It thrives in almost any humid soil and is propagated by greenwood cuttings in summer glass, and rarely by seeds. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 974.)

Enkianthus campanulatus (Miq.) Nichols. (Ericaceae.) 43845. Plants from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A Japanese shrub, 15 or occasionally 30 feet high, with elliptic leaves up to 3 inches long, and yellowish or pale orange flowers with darker veins, occurring in drooping racemes. One of the handsomest species and the most vigorous grower. In autumn the foliage turns a brilliant red. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 1115.)

Indigofera amblyantha Craib. (Fabaceae.) 43850. Plants of **indigo** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. An upright shrub from central China, 3 to 6 feet high, with compound bright green leaves from 4 to 6 inches long, very numerous small pink flowers in slender axillary racemes, and linear hairy pods. The pink flowers bloom all summer long, and the shrub is propagated by cuttings and seeds. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 3, p. 1646.)

Larix potaninii Batalin. (Pinaceae.) 43851. Plants of **larch** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A tree from western China, from 60 to 70 feet high, with yellowish young shoots and somewhat rectangular pointed leaves about an inch long. The cones are egg-shaped, and about 1½ inches long. This tree has much the aspect of the common larch, and according to Mr. E. H. Wilson it yields the most valuable timber in China. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 9.)

Malus arnoldiana Rehder. (Malaceae.) 43857. Cuttings from Jamaica Plain, Mass. Presented by the Arnold Arboretum. This is a hybrid of *Malus floribunda* with one of the hybrids of *Malus baccata*, and appeared spontaneously in the Arnold Arboretum several years ago. It makes a smaller tree than *M. floribunda*, but its long spreading and arching branches are very graceful, and the flowers produced on long stems are more than twice as large as those of *M. floribunda*. These flowers are a beautiful pink, and it is considered by some persons to be the most beautiful of the crabapples. (Adapted from the Arnold Arboretum, Bulletin of Popular Information, Nos. 3, 1911, and 39, 1913.)

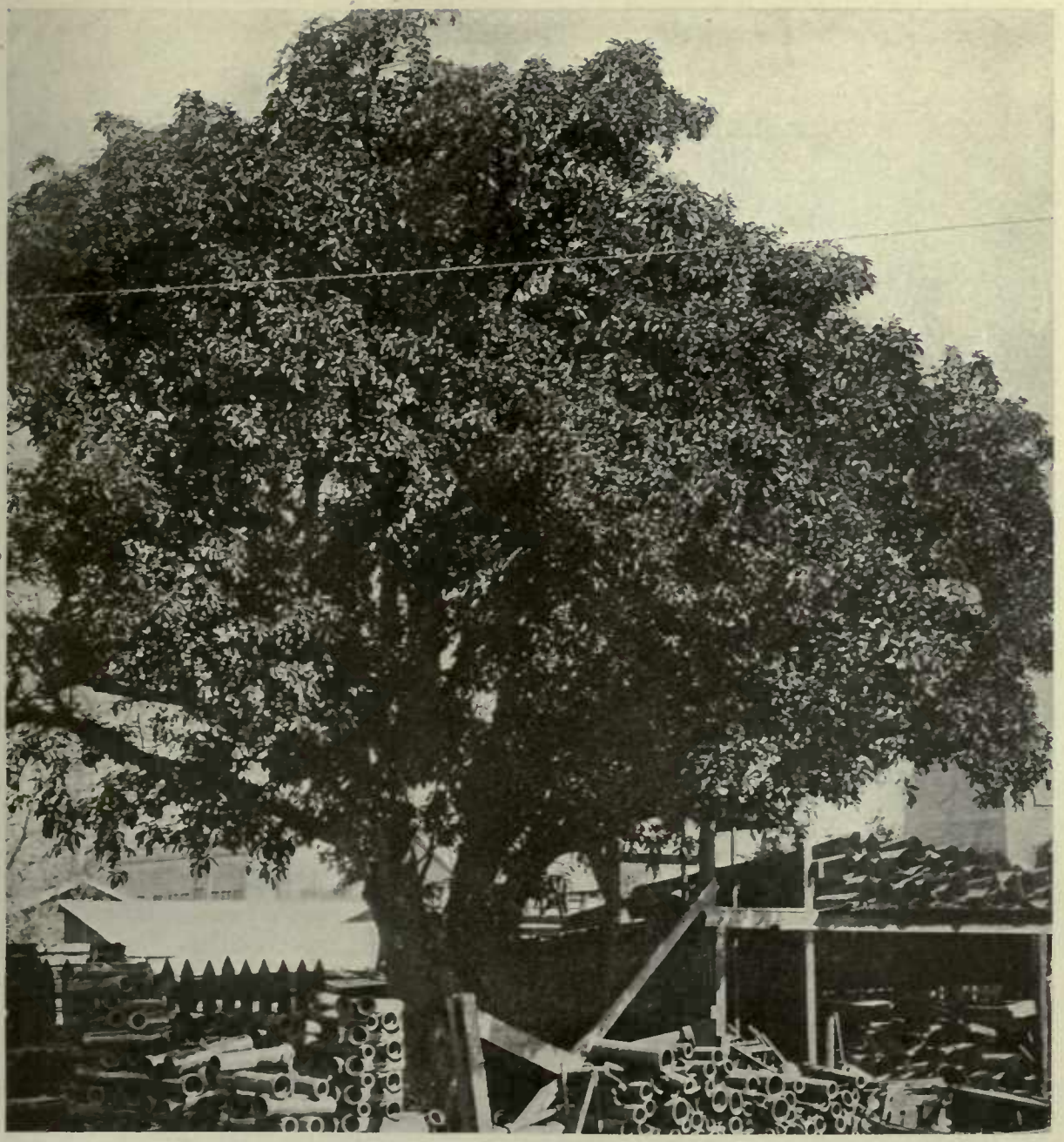
Moringa oleifera Lamarck. (Moringaceae.) 43761. Seeds from Matania El Saff, Egypt. Presented by Mr. Alfred Bircher, Middle-Egypt Botanic Station. "The pods of this variety are free of the bitter taste of the common horse radish tree, and are eaten like the French beans if gathered when in a young state." (Bircher.)

Persea americana Miller. (Lauraceae.) 43932. Cuttings of **avocado** from Coban, Depto. de Alta Verapez, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "From the yard of Filadelfo Pineda, called de San Marcos. A fruit of medium size, obovoid to pyriform in shape, green, with a rather small seed and flesh of exceptionally rich flavor and good quality. My attention was called to this tree by Mr. R. W. Hempstead, who recommended it as the finest avocado he had eaten in Coban. The tree is said to be a heavy bearer, but this is an off year in Coban and it is not bearing a large crop. Form obovoid, tending to become pyriform, slightly oblique; size about medium, weight 15 ozs., greatest length 4⅝ inches, breadth 3⅜ inches; base rounded, the stem inserted obliquely without depression; apex

rounded; surface slightly rough, deep green in color with few small yellowish dots; skin moderately granular, woody, and brittle; flesh abundant, deep yellow in color, changing to pale green near the skin, said to be of unusually rich flavor; quality probably very good to excellent; seed rather small in comparison to the size of the fruit, roundish oblate in form, 1½ inches long, 1¾ inches broad, with both seed coats adhering closely, and fitting tightly in the cavity. Season at Coban said to be January to April. At the time of my visit the fruits were not quite ripe. The parent tree is 30 years old, with a trunk 18 inches in diameter at the base, and a dense spreading crown 40 feet aroad." (Popenoe.)

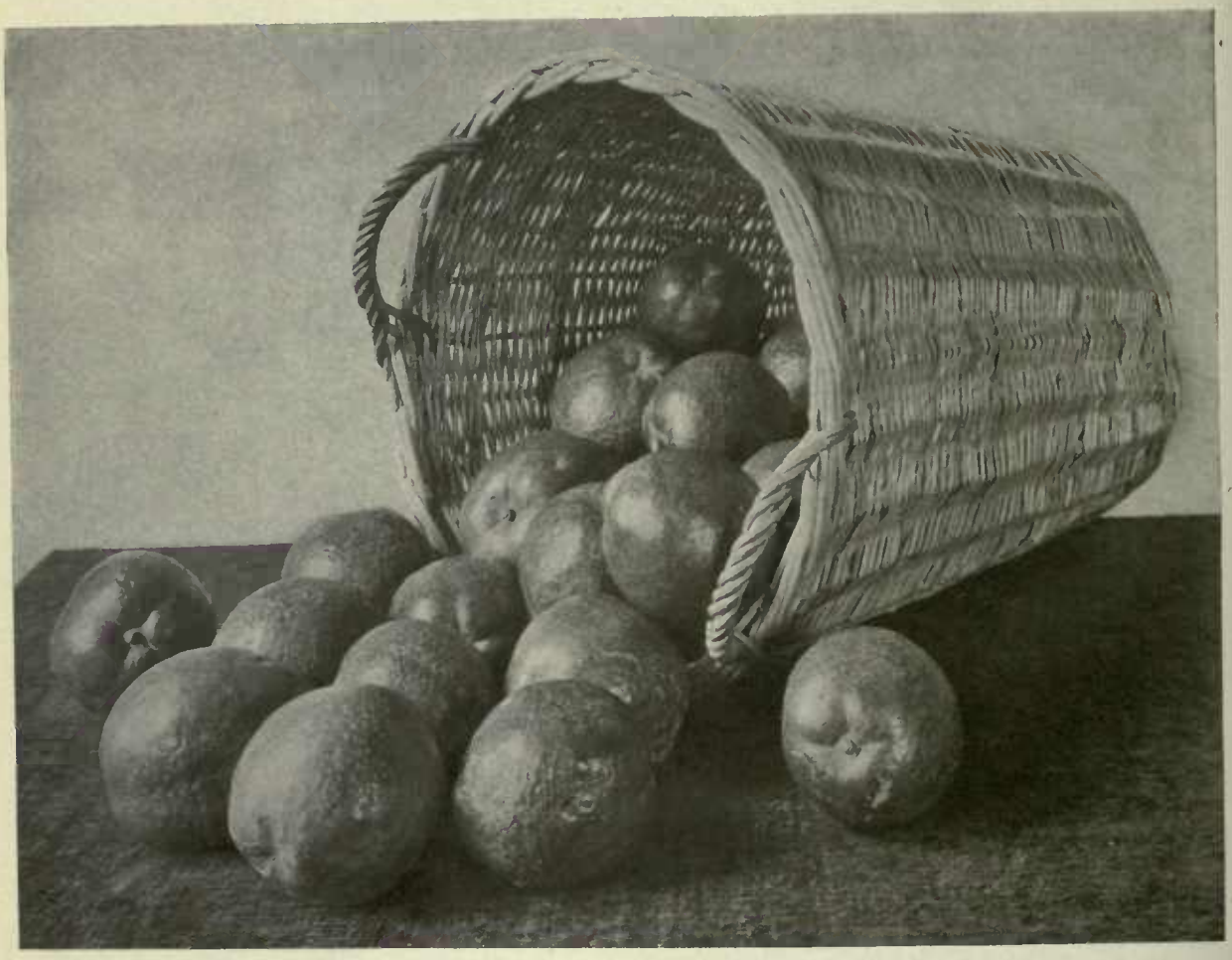
Persea americana Miller. (Lauraceae.) 43933-43935. Cuttings of **Avocado** from San Cristobal Verapaz, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer of this Department. 43933. "From the dooryard of an Indian in the southwest quarter of the village of San Cristobal. A very attractive small fruit, selected first for its earliness in ripening, and secondly for its productiveness and good quality. It is more or less pear-shaped, weighs about half a pound, is nearly smooth externally and of a bright green color, while the seed is unusually small and the flesh is of good quality for an early ripening variety. It is noteworthy that nearly all the early varieties I have found in Guatemala are inferior in richness of flavor to those which ripen later, and it also seems that a great many of them have large seeds. This was especially notable in the fruits examined around Antigua. Form elliptic pyriform, not distinctly necked; size below medium, weight 8 to 9 ozs., length 3¾ inches, breadth 2¾ inches; base narrowly pointed, the stem inserted almost squarely without depression; apex obliquely flattened though not conspicuously so; surface nearly smooth, bright green in color, with numerous minute yellowish dots; skin 1/16 to nearly ⅛ inch thick, coarsely granular and woody, brittle; flesh cream color, tinged with pale green near the skin, free from fiber and of smooth, firm texture; flavor nutty, pleasant, not so oily as in some of the later varieties; quality good; seed small in comparison with the size of the fruit, broadly elliptic to spherical in form, weight 1 oz., both the seed coats rather thin and adhering closely to the smooth cotyledons. The parent tree is about 45 feet high, with a spread

about equal to its height. The trunk is two feet thick at the base. Apparently the fruits must commence to ripen in October or November, since a great many have already fallen, as indicated by the quantity of fresh seeds on the ground beneath the tree. A large proportion of the fruits left on the trees seem still to be immature, so that this variety can probably be considered to have a very long season. The tree is carrying an enormous crop, as may be expected of one whose fruits are of this size. It is probably safe to say that it will produce more than 2000 fruits this season. This has every appearance of being a very desirable variety." 43934. "From the dooryard of Francisco Muus, in the southwest part of the village of San Cristobal. Taken all around, this seems to me to be much the finest variety of avocado which I have yet seen in Guatemala. Its fine large size, good form, and exceedingly rich flesh, coupled with the fact that the seed is unusually small in proportion to the size of the fruit, make it of great interest to those desirous of obtaining the best varieties of the avocado for cultivation in California and Florida. The fruit is broadly oval, slightly oblique, and weighs 20 to 22 ounces. It is green in color, has a hard brittle skin, and the flesh is smooth, free from fiber, deep yellow in color, and of excellent quality. The extraordinarily small seed is tight in the cavity, as it is in every variety of the Guatemalan type which I have examined up to the present time. The tree seems to be a good bearer, and ripens its fruits in January and February at San Cristobal, which is 4550 feet above sea level. Form broadly oval, slightly oblique; size very large, weight 20 to 22 ozs., length 4½ inches, breadth 4 inches; base obliquely flattened, the stem inserted without depression; apex obliquely flattened, slightly depressed around the stigmatic point; surface pebbled to rather rough, deep green in color, with numerous rather large yellowish dots; skin 1/16 inch thick, slightly thicker over some portions of the fruit, coarsely granular, brittle; flesh of an unusually rich yellow color, changing to pale green near the skin, free from fiber and of fine smooth texture; flavor very rich and pleasant; quality excellent; seed very small in proportion to the size of the fruit, oblate, weighing 2 ozs., tight in the cavity with both seed coats adhering closely to the cotyledons, which are slightly rough for this type. Season January to March at San Cristobal Verapaz. The



A CENTURY-OLD WHITE SAPOTE TREE AT SANTA BARBARA, CAL., CASIMIROA EDULIS.

This tree, situated on De la Guerra Street, is a horticultural landmark in California, having been planted about 1810 by one of the Mexican settlers. It is believed by Franceschi to have been the first tropical fruit tree planted in the State. It bears regularly, but its fruits are small and sterile. The fact that it is still vigorous and robust, though uncared for amidst the most unfavorable surroundings, speaks well for the hardiness and resistance to drought of this Mexican tree. Photographed (P16227FS) by Wilson Popenoe, at Santa Barbara, Cal., October 30, 1914.



FRUITS OF THE WHITE SAPOTE, CASIMIROA EDULIS.

The white sapote is a spring fruit, ripening in May in Florida. It can be picked green and ripened off the tree, has a delicate but extremely agreeable bitter aftertaste which prevents its sweetness from cloying, and its smooth, fiberless, custardlike texture is extremely attractive. To some people it does not appeal, while others are very enthusiastic over it. There are varieties superior to this one, which is from a Mexican seedling tree at the Miami Garden. Photographed (P19536FS) by E. L. Crandall, May 29, 1916.

parent tree is about 30 feet high, the trunk 8 inches thick at the base, and the crown slender, as it is crowded in among other trees. It is bearing a good crop of fruit this season." 43935. "From the cafetal of Don Miguel Gomez, south of the plaza, in the village of San Cristobal Verapaz. This is a fine large fruit almost identical in form and size with the Trapp variety in Florida. It has a smaller seed than the Trapp, however, and the size of the fruit will perhaps average somewhat larger. It is of excellent quality, and the tree is a heavy bearer, so that it looks like a very promising variety. Form spherical to somewhat oblate; size large, weight 18 ozs., length $3\frac{7}{8}$ inches, breadth $3\frac{3}{4}$ inches; base rounded, the stem inserted without depression; apex rounded or almost imperceptibly flattened; surface slightly pebbled, deep green, with a somewhat glossy character, and numerous rather large yellowish dots; skin more than 1/16 inch thick, not quite $\frac{1}{8}$ inch, coarsely granular, woody, brittle; flesh creamy yellow, tinged with pale green near the skin, free from fiber and of fine, firm texture; flavor rich and pleasant, not watery; quality excellent; seed medium sized, oblate, weighing nearly 3 ozs., tight in cavity, with both seed coats rather thin and adhering closely to the lightly wrinkled cotyledons. Season January to March at San Cristobal Verapaz, elevation 4550 feet. The parent tree is about 50 feet high, with a spread of 60 feet, the trunk 3 feet in diameter at the base. It is carrying a heavy crop of fruit." (Popenoe.)

Populus maximowiczii A. Henry. (Salicaceae.) 43862. Cuttings of **poplar** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A magnificent large poplar, the largest in eastern Asia, becoming 100 feet high and 6 feet in diameter. The pale brown branchlets are densely pubescent, and the nearly circular leaves, which are whitish or rusty beneath are about 4 inches long. The fruiting catkins are from 7 to 10 inches long, remaining on the tree unopened until late summer or autumn. The shapely head and attractive foliage make this hardy poplar very desirable. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2763.)

Pyrus communis L. (Malaceae.) 43737-43739. **Pear** from Ottawa Canada. Presented by the Director, Central Experiment Farm. "Professor A. J. Logsdail,

Assistant in Plant Breeding at the Central Experiment Farm, Ottawa, tells me the three varieties of Russian pears constitute a part of an original introduction by the late William Saunders, twenty-five or thirty years ago. Out of a large number of pears brought in from Russia, the following three varieties are the only survivors. They have proved to be very hardy as far as cold resistance is concerned, and have also proved, in a large measure, blight resistant. I saw the three trees growing while at Ottawa last September; they were vigorous specimens, the trunks being eight to ten inches in diameter, and they had a fine growth of wood and foliage. I saw no evidence of blight on the trees. The fruit of all three varieties is said to be fairly good. They here take on all the usual characteristics of the Russian types." (B. T. Galloway.)

Rosa davurica Pallas. (Rosaceae.) 43887. Plants of rose from Jamaica Plain, Mass. Presented by the Arnold Arboretum. This is allied to the Cinnamon rose, and is found in Manchuria, Dahuria and Sakhalin. It has slender, straight prickles. The flowers are purple and the fruit scarlet. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 5. p. 2998.)

Rosa ecae Aitchison. (Rosaceae.) 43888. Plants of rose from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A very spiny shrubby rose, from Turkestan, flowering in early summer with an abundance of small, deep yellow flowers. Recommended for hybridization to create perfectly hardy yellow roses. (Adapted from note of Frank N. Meyer.)

Rosa fedtschenkoana Regel. (Rosaceae.) 43890. Plants of rose from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A very handsome species from the Turkestan and Kokand regions of central Asia. It is a much-branched, very prickly shrub, with compound leaves 4 to 5 inches long, and large white flowers occurring singly or as many as four in a cluster. The red fruits are somewhat pear-shaped. When introduced in England this rose developed into a rambling, free-growing shrub, which flowered in the month of June. (Adapted from Curts's Botanical Magazine, vol. 127, plate 7770.)

Rosa omeiensis Rolfe. (Rosaceae.) 43904. Plants of rose from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A stout, branched shrub, from 3 to 10 feet high, with the young shoots covered with dense bristles, and the older stem armed with stout straight thorns. The long, green leaves are composed of 9 to 13 sharply serrate leaflets, and the white flowers, which are over an inch in diameter, occur singly on short lateral twigs. The bright red fruits are up to half an inch in length, and their yellow stalks are very striking in autumn. These fruits are said to be eaten in China, where the plant grows at elevations of from 8000 to 9500 feet. It thrives in good loamy soil, and may be propagated from the freely produced seeds. (Adapted from Curtis's Botanical Magazine, plate 8471.)

Syringa reflexa Schneider. (Oleaceae.) 43922. Lilac from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A western Chinese bush 7 to 10 feet high, with oval, sharp-pointed leaves, and violet flowers in long hanging racemes. On account of the remarkable inflorescence of this lilac it is quite distinct from all others of its kind. (Adapted from Schneider, Illustrierte Handbuch der Laubholzkunde, vol. 2, p. 779, and from Sargent, Plantae Wilsonianae, vol. 1, part 2, 1912.)

Tipuana tipu (Benth.) Lillo. (Fabaceae.) 43755. Seed from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A tall, handsome tree, with rose-colored or creamy white wood, native of the sub-tropical, temperate and cool regions of Agrentina. (Adapted from Lillo, Contribucion al Conocimiento de los Arboles de la Argentina, p. 58.)

Tristania conferta R. Brown. (Myrtaceae.) 43783. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A tall tree, with smooth brown deciduous bark and dense foliage. The alternate leaves are from 3 to 6 inches long, and the rather large flowers occur in 3 to 7 flowered cymes. This tree is a native of Australia, and the timber, which is very strong and durable, is used in ship-building and for making wharves and bridges. The bark is occasionally used for tanning. (Adapted from Maiden, Useful Native Plants of Australia, pp. 330, 608, 609, and from Bailey, Queensland Flora, part 2, p. 636.)

Ulmus pumila L. (Ulmaceae.) 43791. Cuttings of **elm** from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "A weeping form of the ordinary very drouth and alkali resistant elm from North China and Manchuria. The Chinese graft this variety on the common form, generally from 5 to 8 feet above the ground. Obtained from the Botanic Garden at Peking." (Meyer.)

Wistaria venusta Rehder & Wilson. (Fabaceae.) 43792. Cuttings from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "A vigorously growing hardy species of Wistaria, blooming at the end of April and early May, bearing multitudes of rather short and dense racemes of individually large flowers which are of purplish-violet color when first coming out, but when fading away become of pale-bluish color. They exhale a delightful scent. This species is quite drouth resistant and tolerates a fair amount of alkali. The Chinese most often train it as an arbor over a garden walk or over an open space, underneath which seats and tables can be arranged for enjoyment of the beauty and fragrance of the flowers in spring and the shade of the foliage during the hot summer months. Chinese name *Teng lo,* meaning 'Winding rattan'. Obtained from the Botanic Garden at Peking." (Meyer.)

Zea mays L. (Poaceae.) 43789. Seed of **corn** from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. One ear of corn, presented by Don Manuel Lemus, Director of Agriculture. This is of an interesting variety called by Dr. Lemus '*Zea guatemalensis*'. It originated in the Department of Sacatepequez, but this seed was grown in the vicinity of Guatemala City. According to Sr. Lemus, this corn contains very little gluten, grows to a great height, and has proved to be a very valuable strain." (Popenoe.)

Notes from Correspondents abroad.

THE COYO OR SHUCTE

Mr. Wilson Popenoe, Agricultural Explorer, writes from Guatemala City, February 10, 1917:

"In the mountains of northern and eastern Guatemala there grows a fruit closely resembling the avocado, yet sufficiently different in foliage and flower to indicate that it is a distinct species, propably as yet undescribed botanically. For the time being it must, therefore, be termed *Persea sp.* In eastern Guatemala, around Zacapa, Gualan, Chiquimula, and El Rancho it is called shucte, chucte or sometimes chaucte, while in the northern part of the Republic,--immediately across the great Sierra de las Minas,--it is known under the names coyo and coyocté. These latter names have been thought by some to indicate two distinct fruits, perhaps distinct species, but an examination of several trees in the Alta Verapaz shows that they are in reality the same. Apparently the Indians call the cultivated fruit (for it is often grown in their gardens and around their huts) coyo, and the wild tree, which is abundant in the mountains, coyocté. The suffix té in the Quekchi language is said to mean tree; coyocté would therefore mean nothing more than coyo tree.

"In some sections of the Alta Verapaz the coyo is fully as common as the avocado, and seems to be held by the Indians in practically the same high esteem. An American coffee planter who lives in this region tells me that he considers the coyo even superior to the avocado in flavor, and after testing it I am inclined to agree with him.

"The coyo must be considered, then, an unusually interesting new fruit, but it has certain defects which make it seem, on the whole, inferior to the avocado. It has, for example, a large seed in most cases, and the flesh is sometimes disagreeably fibrous. But it is quite variable, like its relative the avocado, and some coyos are much superior to others.

"The coyo tree looks, at first glance, much like an avocado tree, and usually reaches about the same size. It is distinguishable from the avocado by the character of its leaves, which, upon close examination, are seen to differ from those of the avocado in form, to be larger, and to have more or less brownish

pubescence on the lower surface, especially along the midrib. The flowers, when seen from a distance, look like those of the avocado, I have not yet examined them closely.

"The fruits are remarkably similar in general appearance to avocados of the West Indian type, such as are grown in Florida. Like avocados, they vary greatly in form. Most commonly they are pyriform, with a well defined neck, but they are sometimes obovoid, sometimes broadly pyriform, and sometimes long and slender. In size they are also quite variable, but the majority seem to be from three quarters of a pound to a pound and a half in weight. I have heard of coyos weighing two to three pounds, but I have not seen them. The surface is about as smooth as that of a West Indian avocado, and often of similar color,--yellowish green,--but sometimes it is purplish or bronze. The skin is thicker than that of any avocados except those of the Guatemalan type. It is not hard, however, as in the latter, but leathery and pliable. Frequently it adheres to the flesh, which is of a peculiar brownish white color, gives off a milk-like juice when squeezed, and is of fine, oily texture, like the flesh of an avocado. Commonly there are numerous fibers running through the flesh. There are said to be coyos practically free from fiber, but I have not as yet seen them. The flavor is strongly suggestive of the avocado, being of the same rich, nutty character, but is nevertheless distinct; it has a richness and nuttiness of its own, which suggest to me the flavor of a ripe coconut. The seed is larger in comparison to the size of the fruit than it is in the best of our budded varieties of the avocado, but it is no larger than in many seedling avocados. In general appearance it resembles an avocado seed, but the cotyledons, when cut, are seen to be of a dull rose-pink color instead of whitish. The flesh often adheres closely to the seed, making it difficult to prepare the coyo for eating. I have seen some fruits, however, in which the two halves could be separated as in the avocado, the seed coming out readily and leaving a cavity in which seasoning can be placed.

"The coyo is used by the Indians of Guatemala in the same manner as the avocado, which is to say that it is eaten out of hand, without the addition of seasoning of any sort, and frequently to the accompaniment of tortillas,--thin, round cakes, made from Indian corn, which are a staple article of diet

throughout this part of America. I have not yet experimented to see how the coyo tastes when prepared in salads or seasoned with vinegar, salt and pepper, but I have found it excellent when diced and eaten in bouillon, as is often done with the avocado by Guatemalans of the upper classes. To me its flavor is decidedly agreeable, and a good coyo, free from fiber and with a seed not too large in proportion to the size of the fruit, would impress me as a worthy rival of the avocado.

"The tree grows under a variety of conditions. In the valley of the Motagua river, near Zacapa and El Rancho, it is found near the banks of streams. The air in these regions is exceedingly hot and dry during a large part of the year, the hillsides being covered with typical desert vegetation,--cacti, euphorbiads, and thorny leguminous shrubs and small trees. Contrasted with these conditions, the upper Polochic valley, in the Alta Verapaz, where the coyo is exceedingly abundant, is a very moist region, with rainfall,--as the inhabitants state,--thirteen months in the year. In this part of Guatemala I have seen coyos at elevations well above 5000 feet. Like the Guatemalan type of avocado, it is very abundant from 4000 to 5000 feet, but unlike the latter it seems also to do very well at lower elevations, being found around Zacapa at elevations of 500 feet above the sea, where the Guatemalan type of avocado is usually replaced by the West Indian.

"Judging from its behavior in Guatemala, the coyo ought to be successful in both California and Florida. During the coming summer I hope to make a search for superior trees and obtain budwood for introduction into the United States. The season of ripening is from June to August in the lowlands, and in August to October or even November in the highlands. There are thousands of trees in the Verapaz, and it should certainly be possible to find among them a few superior ones, well worthy of propagation.

"In the coyo we have a fruit new to North American horticulture,--so new, in fact, that it does not even have a botanical name,--yet one which is grown by the Indians of northern Guatemala as extensively as the avocado, and apparently looked upon by them as almost its equal. When good varieties have been obtained, and propagated by budding, it seems reasonable to expect that the coyo will find a place in the orchards of the United States, throughout approximately the same belt in which the avocado is grown."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer in charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer in charge of Foreign Plant Distribution.
Frank N. Meyer, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, Botanical Assistant, in charge of Collections.
S. C. Stuntz, Botanical Assistant, in charge of Explorers' Notes, Foreign Correspondence and Publications.
R. A. Young, Botanical Assistant, in charge of Dasheen and Tung Oil Investigations.
Edward Goucher, Propagator.
David A. Bisset, Nathan Menderson, and G. P. Van Eseltine, Assistants.

Staff of Field Stations.

R. L. Beagles, Farm Superintendent in charge of Chico, Calif., Plant Introduction Field Station.
J. M. Rankin, Assistant Farm Superintendent, in charge of Rockville, Md., (Yarrow) Plant Introduction Field Station.
Edward Simmonds, Gardener and Field Station Superintendent in charge of Miami, Fla., Plant Introduction Field Station.
J. E. Morrow, Assistant Superintendent in charge of Brooksville, Fla., Plant Introduction Field Station.
H. E. Juenemann, Assistant Field Station Superintendent in charge of Bellingham, Wash., Field Station.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Dr. Gustav Eisen, 719 5th Ave., New York City.
Mr. E. C. Green, Serviço do Algodao, Rio de Janeiro, Brazil.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Yokohama, Japan.
Mr. Charles Simpson, Little River, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Dr. H. N. Whitford, Yale School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

No. 129. JANUARY, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Aeschynomene	1107	Garcinia	1112
Aleurites	1107	Genipa	1112
Callicarpa	1107	Poa	1112
Campomanesia	1107	Prunus	1113
Cassia	1108	Psidium	1113
Castilleja	1108	Pyrus	1113, 1114, 1115, 1116
Chamaedorea	1108	Rhus	1115
Colocasia	1109	Sorbus	1115
Cotoneaster	1110	Uvaria	1115
Dahlia	1111		
Deguelia	1111		

Plates:

Pl. 211. A Sicilian Pistache tree in California, *Pistacia vera.*

212. An ornamental Tropical Yam, *Dioscorea sp.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

October 2, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Aeschynomene sp. (Fabaceae.) 44040. Seeds from El Coyolar, Costa Rica. Presented by Mr. Carlos Wercklé. "Yellow sensitiva. A very dense growing leguminous annual, whose roots are always completely covered with nodules. People say they are a good forage, but I have never seen a cow eating them. Our best plant for nitrification of the soil." (Wercklé.)

Aleurites trisperma Blanco. (Euphorbiaceae.) 44061. Seeds from Philippine Islands. Presented by Mr. A. W. Prautch, through Mr. Adn. Hernandez, Director, Manila Bureau of Agriculture. "Mr. Prautch has returned from his trip to Cavite province with seeds and leaves of the *Aleurites trisperma* tree. The nuts were picked up under the trees where they had been lying since last August, which month the tree fruits. As you have already successfully introduced *A. moluccana* in the United States, it is quite possible that this species will also be successful. It is believed that this soft shell kind is superior, for in addition to the nut being easier to crack, the Bureau of Science has found that the oil so closely approximates the Chinese tung oil as to be practically indistinguishable therefrom. There is a slight difference between this oil and that of the *Aleurites moluccana*." (Hernandez.)

Callicarpa giraldiana Hesse. (Verbenaceae.) 44076. Cuttings from Jamaica Plain, Mass. Presented by the Arnold Arboretum. An ornamental shrub from western China, with dentate leaves 2 to 4 inches long, dense cymes of pink flowers on hairy stalks, and violet fruits. If sheltered this shrub will grow in the northern parts of the United States, and if killed to the ground, young shoots will spring up vigorously, producing flowers and fruit in the same season. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 629, under *C. giruldii.*)

Campomanesia fenzliana (Berg) Glaziou. (Myrtaceae.) 44086. Seeds from Parana, Brazil. Presented by Mr. B. H. Hunnicutt, Lavras, Minas, Brazil. A small Brazilian myrtaceous tree with foliage resembling that of the European oaks. It reaches a height of 30 to 35 feet, and bears orange yellow fruits up to an inch in diameter, with edible pulp resembling that of the guava. (Adapted from note of Dorsett, Shamel and Popenoe.)

Cassia eremophila A. Cunningham. (Caesalpiniaceae.) 44071. Plants from Wellington Point near Brisbane, Queensland, Australia. Presented by Mr. James Pink. "A very handsome flowering shrub." (Pink.) A woody plant, found in Australia, in all the colonies except Tasmania. The leaves are composed of two pairs of very narrow leaflets, and the pods are very smooth. In Australia both the pods and the leaves of this plant are eaten by stock. (Adapted from Maiden, Useful Native Plants of Australia, p. 121, and from Vogel, Synopsis Generis Cassiae, p. 47 as *Cassia nemophila.*)

Castilleja indivisa Engelm. (Scrophulariaceae.) 43985. Plants grown at the Plant Introduction Field Station, Chico, California, from seed collected by Dr. David Griffiths, of this Bureau, at Lyford, Texas, May 2, 1915. "One of the most showy of the winter annuals of southern Texas. The seedlings come up very abundantly upon the sandy coastal plain in autumn, developing slowly during the winter but rapidly in early spring, and dominating the color of acres of the landscape in late March and early April. Here its seeds are matured in late April and early May. There are few native plants more showy than this one. This whole group of painted cups, however, are considered somewhat difficult to grow, and are consequently little handled in the trade in this country, although commonly grown in England. Our efforts have met with success and failure in their handling. Recent trials indicate that the habits of the plant, as depicted above, should stand winter handling, and that they can be grown successfully as winter annuals in regions having mild winters with sufficient moisture for seed germination in autumn. It requires a comparatively low temperature for their development, experience at Chico, California, showing that the sudden transition from winter to summer, such as we have, dwarfs the plant before maturity, so that they produce but few of the colored bracts which are so attractive in all of the painted cups or Indian paint brushes." (Griffiths.)

Chamaedorea sp. (Phoenicaceae.) 44059. Seeds of **Pacaya palm** from Coban, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Nearly every garden in Coban contains a number of these small, attractive palms, planted not so much for ornament as for the edible inflorescences which they produce. In

other parts of the Alta Verapaz the pacaya is also quite common, and it is grown in the southern part of Guatemala as well. Since it succeeds here at elevations of 5000 feet or even higher, where the winters are quite cool, it would seem that it ought to be a success in southern California and Florida, though it is difficult to predict what effect the sandy soil of the latter state may have upon it. The palm grows to a height of about 15 feet, having a slender stem about two inches in diameter, and handsome leaves somewhat reminding one of *Chrysalidocarpus lutescens* (*Areca lutescens*). The foliage is of a rich green color. The inflorescences are produced along the trunk, in the winter and spring, and apparently more or less throughout the year. Before the spathe has opened it is removed from the palm, opened, and the tender inflorescence, nearly white in color, and finely branched, is removed and eaten. Its preparation for the table consists in dipping it in a batter made of eggs and then frying it, in enveloping it in an omelet, in boiling it and serving it as a vegetable, or in mixing it with other vegetables to form a salad. When very young and tender its flavor is agreeable but when older, and nearly ready to emerge from the spathe, the inflorescence has a strongly bitter taste which makes it disagreeable. It should, therefore, be used when quite young. The pacaya palm grows in a variety of soils, seeming to do well on clay and also on black sandy loam. An abundance of lime in the soil does not seem to injure it. It is frequently planted in gardens among coffee bushes, and in many sections it is planted beneath large trees, where it may have partial shade. I have seen many beneath large avocado trees, inter-planted with coffee bushes. It may be necessary to furnish shade for the palms in California and Florida, by means of a slat house or some such device, or they might be planted beneath large trees, as they are here in Guatemala. The pacaya, as an article of food, is extensively used in Guatemala, and by local standards commands a good price, single inflorescences usually selling at 2 to 5 for a peso (2½ cents). The spathes are pulled from the palms, tied together in small bundles, and thus brought to market." (Popenoe.)

Colocasia esculenta (L.) Schott. (Araceae.) 44066. Tubers of **Taro** from Oilla, Texas. Presented by Mr. S. Kato. "*Yatsu-gashira-imo.* A Japanese variety of taro of

the dasheen type. It is said to be the best variety grown in Japan. These specimens grown in Texas, though very small, were mealy and of fine flavor." (R. A. Young.)

Cotoneaster divaricata Rehder & Wilson. (Malaceae.) 43991. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A deciduous upright shrub from central and western China, with shining oval leaves 1/3 to 3/4 inch long. The pink flowers are usually in threes, and the bright red fruit, containing 2 stones, is 1/3 inch long. A very handsome shrub when studded with its bright red fruits, and hardy at the Arnold Arboretum. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 3, p. 865.)

Cotoneaster horizontalis perpusilla Schneider. (Malaceae.) 43992. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A low Chinese shrub of prostrate habit with almost horizontal branches in two dense series and roundish oval leaves less than 1/3 inch long. The flowers are erect, pink, and either solitary or in pairs, and the bright red oval fruit, 1/4 inch in diameter, usually contains 3 stones. One of the most effective fruiting shrubs for rockeries. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 3, p. 865.)

Cotoneaster hupehensis Rehder & Wilson. (Malaceae.) 44079. Cuttings from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A shrub, native of central and western China, up to 5 feet in height, with slender spreading branches, oval or elliptc leaves with gray wool on the lower surfaces, 6 to 12 white flowers in each of the numerous cymes, and red, nearly globular fruits about 1/3 inch in diameter. This is one of the handsomest of Cotoneasters in bloom, and is hardy as far north as Massachusetts. (Adapted from Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 867.)

Cotoneaster tenuipes Rehder & Wilson. (Malaceae.) 43995. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A gracefully-branched, deciduous shrub, from western China, up to 7 feet high, with oval or elliptic-oval, sharp-pointed leaves, about one and three fifths inches long. The flowers

are unknown as yet, but the fruits are nearly black, usually solitary, and contains 2 stones. (Adapted from Sargent, Plantae Wilsonianae, vol. 1, part 1, p. 171.)

Dahlia imperialis Roezl. (Asteraceae.) 43981. Cuttings of **dahlia** from Tactic, Depto. de Alta Verapaz, Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer. "Double white variety. The pink tree Dahlia is common throughout a large part of Guatemala. I have seen it from Antigua to Coban often in great abundance, its huge single pink flowers, four inches in diameter, making it a very striking thing. The pink form, which apparently is the typical one, is the only form which I have seen in the southern part of Guatemala, but in the vicinity of Tactic there are three other forms. None of these is so common as the pink form, but all are seen occasionally in gardens. The forms in question are: a single white, identical with the typical single pink except in its color, which is pure white; a double pink, of the same lilac pink shade as the typical form but with double flowers, three inches in diameter; and a double white form, of the same character as the double pink but pure white. The tree dahlia is called *shikar* in the Pokomchi dialect, which is the language of the Indians at Tactic. It is very commonly planted around gardens and dooryards to form a hedge; large cuttings, 3 to 4 feet long and of stems one to two inches in diameter, being inserted in the ground, and apparently rooting very readily. The plants grow to 15 feet in height, and when in full bloom, as they are at this season of the year, are a glorious sight. Tactic is made beautiful by this common plant, and it would seem well worth while to test it for hedges in California, where the pink form has already been introduced and is offered in the trade. The variety sent in under this number is the double white, which seems to be one of the most beautiful of all. The flowers of this form are extensively used by the Indians of Tactic for decorating the images of saints which they have in their houses and in the churches." (Popenoe.)

Deguelia dalbergioides (Baker.) Taubert. (Fabaceae.) 44073. Seeds from Ceylon. Presented by Father Jerome, St. Leo Abbey, St. Leo, Florida. A small, spreading tree, 15 to 20 feet high, found in the Malay Archipelago and Java. The branchlets are brown-silky, the dark green compound leaves are 6 to 8 inches long,

the rose-colored flowers are in numerous short-stalked racemes, and the thin, flat pods are up to 2½ inches long. (Adapted from J. D. Hooker, Flora of British India, vol. 2, p. 241, under *Derris dalbergioides.*)

Garcinia dioica Blume. (Clusiaceae.) 44085. Seeds from Lawang, Java. Presented by Mr. M. Buysman. "The fruit of this tree is eaten." (Buysman.) A Javanese tree up to 60 feet high, with membranous, lance-shaped leaves up to 5 inches long, pink flowers in few-flowered axillary or terminal clusters, and nearly globular fruits up to one and three fifths inches in greatest diameter. The natives of Java call this tree *Tjeuri* and *Kemedjing.* The wood is of little use, but in some portions the fruits are sought for the sake of the taste of the seed-coats. (Adapted from S. H. Koorders and Th. Valeton, Boomsoorten op Java, Bijdrage No. 9, pp. 369–372.)

Genipa americana L. (Rubiaceae.) 44090. Seeds of **Genipap** from Lamao, Bataan, P. I. Presented by Mr. P. J. Wester, Lamao Experimental Station through Mr. Adn. Hernandez, Director, Manila Bureau of Agriculture. A large stately tree, native of the American tropics, growing 60 feet in height, with dark green leaves a foot or more long. The edible fruits are about the size of an orange. (Adapted from the note of Dorsett and Popenoe.)

Poa flabellata (Lam.) Hook. f. (Poaceae.) 44000. Seeds of **Tussock** grass from Stanley, Falkland Islands. Procured from Mr. W. A. Harding, Manager, Falkland Islands Company, through Mr. David J. D. Myers, American Consul, Punta Arenas, Chili. A coarse grass, native of the Falkland Islands, growing on peat soils near the sea. The plant forms dense masses of stems, which frequently rise to a height of from 4 to 6 feet, and the long, tapering leaves hang gracefully over in curves, from 5 to 8 feet long and an inch wide at the base. The plant is much relished by cattle, being very nutritious and containing saccharin. The inner portion of the stem, a little way above the root, is soft and crisp, and flavored like a hazel nut; the inhabitants of the Falkland Islands are very fond of it. They also boil the young shoots and eat them like asparagus. (Adapted from Hogg, Vegetable Kingdom, pp. 823–824.)

A SICILIAN PISTACHE TREE IN CALIFORNIA, PISTACIA VERA, S. P. I. No. 12782.

Early introductions of the pistache nut trees made by Fairchild and Swingle from Greece and Syria in 1899 and 1900 have grown well in California and their behavior has been under observation for some time by Messrs. W. T. Swingle and G. P. Rixford. The prospect of commercial pistache nut culture in California is emphasized by the vigor and health of this tree, introduced by Mr. T. H. Kearney from Bronte, Sicily, in 1905. It is a female and fruiting this season. Photographed (P19669FS) by P. H. Dorsett, Chico, Cal., Field Station, May 9, 1916.

AN ORNAMENTAL TROPICAL YAM, DIOSCOREA SP., S. P. I. No. 38134.

The ordinary cinnamon vine (*Dioscorea batatas* Decsne.) which is related to this specie produces such quantities of small aerial tubers resembling miniature potatoes, and these produ such persistent vines that they are a veritable nuisance in a border. This large-leaved speci however, which produces aerial tubers as large as a good-sized potato, has distinct possibilities as screen vine for porches and may prove valuable treated as an annual much above the frost lir Photographed (P19630FS) by P. H. Dorsett at Miami Field Station, June 16, 1916.

Prunus bokhariensis Royle. (Amygdalaceae.) 43988. Cuttings of **plum** from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanical Gardens. "Alucha black." A plum from Chinese Turkestan, with medium-sized golden-yellow, clingstone fruits of fine flavor, which ripen late in July. They are excellent for preserves and jellies. (Adapted from note of Frank N. Meyer.)

Psidium guajava L. (Myrtaceae.) 43998. Seeds of **white guava** from Caracas, Venezuela. Collected by Dr. J. N. Rose, U. S. National Museum. "Seeds of a very large guava, the largest I have ever seen. It was 4 inches long and resembled somewhat a large Bartlett pear. It may be known to you, but was new to me. It was called at Caracas the Peruvian guava, but I saw nothing like it in Peru in 1914. It has only recently been introduced into Caracas. I obtained the seeds from Mr. Frederick L. Pantin, Acting Manager of the Caracas and La Guaira railroad." (Rose.)

Pyrus amygdaliformis Villars. (Malaceae.) 44041. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A small tree, native of southern Europe, occasionally 20 feet or more high, or sometimes merely a large rounded shrub. The leaves, which are very variable in shape and size, are from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches in length, the white flowers, 1 inch wide, are produced in April in corymbs, and the round, yellowish-brown fruits are about an inch in diameter. The chief merit of this tree is its picturesqueness in age. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 273.)

Pyrus betulaefolia Bunge. (Malaceae.) 44042. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A slender, fast-growing, graceful tree from northern China, attaining a height of 20 to 30 feet, with the young shoots thickly covered with a persistent gray felt. The dark green oval or roundish, dentate, long-pointed leaves are 2 to 3 inches long, the white flowers, $\frac{3}{4}$ inch wide, occur eight to ten in corymbs, and the grayish-brown roundish fruits are about the size of a pea. The Chinese use this as a stock on which to graft fruiting pears. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 279.)

Pyrus calleryana Decaisne. (Malaceae.) 43987. Scions of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. This wild Chinese pear is not uncommon in western Hupeh at an altitude of from 1000 to 1500 m., and is easily recognizable by its comparatively small, crenate leaves and small flowers. This pear maintains a vigorous and healthy appearance under the most trying conditions, and might prove to be a very desirable blight-resistant stock. Also the woolly aphis, which attacks other species of pears, has not been known to touch this species. (Adapted from Compere, Monthly Bulletin California State Comm. Hort. vol. 4, pp. 313, 314, and from Rehder, Chinese Species of Pyrus, Proc. Am. Acad. vol. 50, pp. 237-238.)

Pyrus oblongifolia Spach. (Malaceae.) 44050. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A small tree, occasionally 20 feet or more high, common in Provence, France. The leaves are oval or oblong, and the fruits, which are yellowish, tinged with red on the sunny side, are about 1½ inches in diameter. In Provence it is known as the *Gros Perrussier.* (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 273.)

Pyrus ovoidea Rehder. (Malaceae.) 44051. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A Chinese tree of pyramidal habit, 30 to 50 feet high, with oval-oblong, sharply serrate leaves 3 to 5 inches long, white flowers in 5 to 7 flowered racemes, yellow, juicy, somewhat astringent exactly egg-shaped fruits up to 1¾ inches long. In autumn the foliage turns a bright scarlet, and the flowers appear a week ahead of other species of pears. (Adapted from A. Rehder, Proceedings of the American Academy of Arts and Sciences, vol. 50, pp. 228-229, and from Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2869.)

Pyrus salicifolia Pallas. (Malaceae.) 44053. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. Var. *pendula* Hort. A very elegant tree, native of southeastern Europe and Asia Minor, from 15 to 25 feet high, with pendulous branches, narrow lance-shaped, finally shiny green leaves 1½ to 3½ inches long, pure white flowers, ¾ inch wide in dense small corymbs, and pear-shaped fruits 1 to 1¼ inches long. The leaves and flowers of this very

ornamental pear often open simultaneously, producing a charming effect. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, pp. 292–293.)

Pyrus ussuriensis Maximowicz. (Malaceae.) 44056. Cuttings of **pear** from Jamaica Plain, Mass. Presented by the Arnold Arboretum. A tree, native of Amur and Ussuri, Siberia, from 20 to 30 feet high, with broadly oval, sharply serrate, acuminate leaves, many-flowered racemes of white flowers, and roundish-oval, umbilicate, mild-flavored fruits over an inch in diameter, crowned by the persistent calyx. In autumn the foliage turns a shining brownish-red, making the tree very ornamental. (Adapted from E. Regel, in Gartenflora, vol. 10, pp. 374–375, plate 345.)

Rhus rufa Teijsm. & Binn. (Anacardiaceae.) 44075. Seeds from Ceylon. Presented by Father Jerome, St. Leo, Florida. An erect, smooth-barked tree, native of the peninsula of Menado, island of Celebes, Dutch East Indies, with leaves composed of 12 to 14 pairs of oblong lance-shaped leaflets with reddish-hairy lower surfaces, and axillary and terminal panicles of white, sessile flowers. The fruits are black, dry, nearly globular drupes containing kidney-shaped seeds. The inhabitants of Menado call this *Kajoe-Kambing*. (Adapted from J. E. Teijsman and D. Binnendijk, Natuurkundig Tijdschrift voor Nederlandsch Indie, vol. 27, p. 52.)

Sorbus pohuashanensis (Hance) Hedlund. (Malaceae.) 43996. Seeds from Jamaica Plain, Mass. Presented by the Arnold Arboretum. An evergreen shrub from northern China, with reddish-brown twigs, leaves composed of 6 to 7 pairs of elliptic or lance-elliptic leaflets from one and three-fifths inches long, and red fruits about one-third inch in diameter. This shrub is in cultivation at the Arnold Arboretum. (Adapted from Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 1, p. 672.)

Uvaria rufa (Dun.) DeCandolle. (Annonaceae.) 44091. Seed of **banauac** from Lamao, Bataan, P. I. Presented by Mr. P. J. Wester, Lamao Experimental Station, through Mr. Adn. Hernandez, Director, Manila Bureau of Agriculture. A much-branched shrub from Java, with a stem about the diameter of a man's arm, alternate, elliptic-

oblong, acute or obtuse leaves 2½ to 5 inches long, purplish-red solitary flowers about an inch wide, and oblong, kidney-shaped, red fruits about 1½ inches long, in bunches of 18 or 20, with whitish, scant, juicy, aromatic, sub-acid flesh without a trace of sugar and containing many seeds. (Adapted from Blume, Flora Java, Annonaceae, pp. 19-21, plate 4, and from P. J. Wester, Philippine Agricultural Review, vol. 6, no. 7, p. 321.)

Notes from Correspondents abroad.

Mr. Frank N. Meyer writes from Ichang, Hupeh, China, April 16, 1917:

"The day before yesterday I returned here from a sixteen days' trip into the mountains and plain of this section of the immense Hupeh Province, investigating mainly problems connected with *Pyrus calleryana, Pistacia chinensis,* tung oil and some minor things."

"*Pyrus calleryana* is simply a marvel. One finds it growing under all sorts of conditions, one time on dry, sterile mountain slopes; then again with its roots in standing water at the edge of a pond; sometimes in open pine forest, then again among scrub on blue-stone ledges in the burning sun; sometimes in low bamboo jungle in the company of the Chinese pistache, *Vitex negundo, Cudrania triloba,* the jujube, *Ulmus parvifolia, Rosa multiflora,* etc., and then again along the course of a fast flowing mountain stream or on the occasionally burned over slope of a pebbly hill.

"The tree is nowhere found in groves, always as scattered specimens and but very few large trees were seen. There are reasons for that, namely the natives cut down the larger specimens for their lumber, from which fine furniture is made, while if a young tree occurs at a suitable place it is most times used as a stock for an improved variety of pear.

"We made a trip of three days to the northwest from here to look at a very large specimen of a wild pear from which a large village had obtained its name (Tang li shu ya) but the tree had become old and had been cut down 40 to 50 years already. It was said to measure something like 11 or 12 feet in circumference. The largest trunk I measured was 6 feet in circumference, but it was as a stock for an improved pear.

"The name of this wild pear is everywhere around here "Tang li", meaning "Crab-apple pear", on account of the resemblance of its fruit to wild crab apples

(*Malus baccata*). There is very much variation in the trees as regards appearance, pubescence of leaves, size of fruits and of flowers, etc. Some trees present a silvery-gray appearance while others are quite green. Whether all of these strains will be equally immune is yet to be solved.

"This pear will be of immense value as a stock for the very greater part of the United States, but more especially so for those parts where the summers are hot and the winters only moderately cold. As a factor in hybridisation work it offers but little prospect since the fruits are ridiculously small, often only the size of a small choke-cherry. *Pyrus ussuriensis* however offers much better promise for breeding work, that is, to obtain a hardy pear for cold regions, but as a stock it probably cannot be grown in regions where summer temperatures go high. Professor Reimer stated to me last September that the leaves of it got slightly scorched at Talent during a hot spell in July, I believe. In China, to my knowledge, I have never seen a specimen of *Pyrus ussuriensis* in a real hot part of the country; it always occurs there where the real *Malus baccata* thrives and *Juglans mandshurica*. Both of these plants love relatively cool summers, just like I do myself.

"And now as regards collecting a large quantity of seeds of the wild *calleryana* pear, for which purpose I made this special sixteen-day trip. Well, around Ichang itself there are too few trees and they are too small; around Kingmen, however, four to five days march due northeast, we found many trees and I have advanced my interpeter 100 Hupeh dollars, which he has been paying out as bargain money to various parties around Kingmen and in the early days of September of this year the natives will try to bring to us in Kingmen about 5000 catties of fresh ripe fruits and we will have to arrange about prices and about cleaning methods.

"So we have to be again here in early September and if not, the advance money is spent in vain and of course no seeds will be received by anybody.

"The climate around Kingmen is much more continental than in Ichang, as the cold winds from Honan strike right down there on their way into Hunan. The Rev. J. S. Johnson, of the Swedish-American Missionary Covenant, who is stationed at times in Kingmen, told me that this winter the ice was 7 to 9 inches thick and his mandarin orange trees had suffered very

severely. In fact, one tree on an exposed place I looked at critically and gave but little hope for recovery except possibly for sprouts from near the base.

"Evergreens like *Ligustrum lucidum, Pittosporum tobira, Euonimus japonicus, Eriobotrya japonica* and *Cupressus funebris* had not suffered at all. The climate struck me as being very similar to that of southwest Louisiana and northeast Texas. Rice, cotton, and soy beans are the main summer crops, while field and green peas, broad beans, lentils, rape, barley, wheat and various strains of *Brassica* are the main winter crops.

"Well this is about all about *Pyrus calleryana*. I may add that I took several interesting photographs and collected herbarium specimens of various types. The small quantity of dried up fruits I found had no living seeds in them, since they had been subjected to seven months exposure to the elements since they were ripe."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D.C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Frank N. Meyer, Wilson Popenoe, and F. C. Reimer, Agricultural Explorers.
H. C. Skeels, S. C. Stuntz, and R. A. Young, Botanical Assistants.
David A. Bisset, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.
Henry Y. Gouldman, Laboratory Aid.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
R. S. Atwater, F. R. Livingstone, and D. M. Wallen, Field Station Aids.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Harry Duffield, Jr., Assistant in Plant Introduction.
Edward Simmons, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
E. J. Rankin and C. H. Steffani, Field Station Aids.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
M. E. Batchelor and M. H. Lee, Field Station Aids.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
H. A. Houser and B. L. Peters, Field Station Aids.

Collaborators.

Aaron Aaronsohn, Haifa, Palestine; Thomas W. Brown, Cairo, Egypt; H. M. Curran, Laurel, Md.; M. J. Dorsey, University Farm, St. Paul, Minn.; Gustav Eisen, New York City; E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro; A. C. Hartless, Seharanpur, India; Barbour Lathrop, Chicago, Ill.; H. Nehrling, Gotha, Fla.; Miss Eliza R. Scidmore, Washington, D. C.; Charles Simpson, Littleriver, Fla.; H. P. Stuckey, Experiment, Ga.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; H. N. Whitford, School of Forestry, New Haven, Conn.; E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PROPERTY OF DIVISION OF FORESTRY COLLEGE OF AGRICULTURE UNIVERSITY OF CALIFORNIA

PLANT IMMIGRANTS

No. 130. FEBRUARY, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Abelmoschus	1127	Juglans	1124
Aeschynomene	1121	Juniperus	1125
Aleurites	1127, 1129	Maytenus	1128
Amaranthus	1121	Medicago	1129
Amygdalus	1121	Myrciaria	1129
Aralia	1128	Perilla	1125
Brassica	1128	Phaseolus	1125
Calamus	1121	Picea	1125
Canarium	1122	Pisum	1125
Cassia	1122	Prunus	1129
Castanea	1122	Psychotria	1126
Citrus	1123	Pyrus	1126
Davidia	1123	Rhynchosia	1126
Diospyros	1123, 1128	Saccharum	1126
Duranta	1129	Soja	1127
Fagopyrum	1124	Vigna	1127
Ficus	1124	Zea	1127

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

October 25, 1917.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Aeschynomene sp. (Fabaceae.) 44113. Seeds from El Coyolar, Costa Rica. Presented by Mr. Carlos Wercklé. "*Yellow sensitiva.* An annual, papilionaceous, dense-growing, nearly trailing plant, finely and densely ramified, resembling the sensitive *Mimosa;* our best plant for enriching the soil. Said to be a good forage plant." (Wercklé.)

Amaranthus paniculatus L. (Amaranthaceae.) 44176. Seeds of an **amaranth** from India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanical Gardens, Saharanpur, who secured them from the Director of Agriculture, Kashmir. A tall, handsome plant 4 to 6 feet high, cultivated in eastern and western Asia and Africa. The lance-elliptic leaves are 2 to 6 inches long, and the numerous flowers are borne in dense red or gold-colored spikes. The subglobose seeds are white, red or black, and because of their farinaceous nature form the staple food of the poorer classes of the hill tribes in many parts of India, where the plant is known as *Rajgira.* (Adapted from T. Cooke, Flora of the Presidency of Bombay, vol. 2, p. 489.)

Amygdalus nana x persica (Amygdalaceae.) 44177. Bud wood of a **hybrid peach** from Excelsior, Minn. Presented by Mr. Charles Haralson, Superintendent, Fruit Breeding Farm. "A hybrid between *Amygdalus nana* and the Bokhara No. 3 peach. This hybrid grows to about eight feet on *Prunus americana* stock, is perfectly hardy and is the best bloomer in the spring of all stone fruits. The tree produces an abundance of pink blossoms, larger than those of *Amygdalus nana*, but it has never borne any fruit. The foliage is glossy dark green and stays on until the frost gets it in the fall." (Haralson.)

Calamus sp. (Phoenicaceae.) 44181. Seeds of **rattan** from the Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist, Lamao Experiment Station, Lamao, Bataan, Philipine Islands. A climbing, spiny rattan, found at medium elevations in northern Luzon and Nueva Vizcaya, Philippine Islands. It attains a height of more than 10 meters with a rather coarse stem, and large branched racemes of round, scaly fruits, which ripen in the last months of the year, becoming 30 mm. in diameter. It is said to have a semitransparent, juicy, subacid pulp of good flavor,

which separates readily from the flesh, and is good eaten as a dessert fruit. (Adapted from P. J. Wester, Philippine Agricultural Review, Third Quarter, 1916, p. 233.)

Canarium amboinense Hochr. (Balsameacece.) Seeds from Buitenzorg, Java. Presented by Dr. Koningsberger, the Director of the Botanic Garden. This beautiful tree, which grows to a height of about 90 feet, so resembles *Canarium moluccana* in general habit and in the leaves that the two can scarcely be distinguished, although the fruit is different. The bark is smooth and white. The fruit of this species is oblong, pointed at both ends, with the angles sharp toward the ends and somewhat flattened toward the middle. This tree is found in the island of Amboina, Celebes. (Adapted from Hochreutiner, Plantae Bogoriensis Exsiccatae, p. 55.)

Canarium ovatum Engler. (Balsameaceae.) 44101. Seeds of the **pili nut** from Camarines, P. I. Presented by Dr. E. B. Copeland, Dean, College of Agriculture, Los Banos, P. I. A tree, native of the Philippines, with compound leaves, and triangular drupes containing one seed. These seeds are eaten throughout the eastern part of the world, and from them is extracted an oil which is used for table purposes and also for burning in lamps. (Adapted from notes of H. H. Boyle, Assistant Horticulturist, Manila, Philippine Islands.)

Cassia bicapsularis L. (Caesalpiniaceae.) 44123. Seeds from Cairo, Egypt. Presented by the Director, Horticultural Division, Ministry of Agriculture, Giza Branch. A shrub, found throughout tropical and subtropical Asia, 2 to 3.5 meters (6 to 10 feet) high, with compound leaves up to 9 cm. (3½ inches) long, yellow flowers, and curved or straight pods up to 15 cm. (6 inches) long by 1.5 cm. (3/5 inch) wide. In Porto Rico, this shrub is known by the native names *sen del pais* and *hoja de sen.* (Adapted from J. Perkins, in Contributions from the National Herbarium, vol. 10, p. 158.)

Castanea mollissima Blume. (Fagaceae.) 44197-98. Seeds of a **chestnut** from China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. This Chinese chestnut has shown itself so resistant to the chestnut blight disease that Mr. Meyer has secured additional quantities from the Pangshan district, northeast of Peking.

Citrus limetta aromatica Wester. (Rutaceae.) 44136. Seeds of **dalayap** from the Philippine Islands. Presented by Mr. P. J. Wester, Bureau of Agriculture, Manila. A spiny Philippine shrub collected at Palawan, with slender, willowy branches; dull green, ovate or elliptic, serrate leaves to 10 cm. (4 inches) long; purplish white flowers borne singly or in terminal or axillary cymes. The roundish, smooth, lemon yellow fruits are 5 cm. (2 inches) long, with thin skin; pale green, juicy, sharply acid pulp; and very numerous, small seeds. (Adapted from P. J. Wester, Philippine Agricultural Review, First Quarter, 1915, p. 25.)

Citrus medica nana Wester. (Rutaceae.) 44137. Seeds of **dwarf citron** from the Philippine Islands. Presented by Mr. P. J. Wester, Bureau of Agriculture, Manila. A small thorny shrub, collected at Cebu; rather common in the Philippines. It bears loose cymes of purplish white flowers, and roundish, egg-shaped, smooth, yellow fruits, $2\frac{1}{2}$ inches or more long. (Adapted from P. J. Wester, Philippine Agricultural Review, First Quarter, 1915, p. 23.)

Davidia involucrata vilmoriniana (Dode) Hemsley. (Cornaceae.) 44127. Seeds from Paris, France. Presented by Vilmorin-Andrieux Co. A tree, 40 to 50 feet high, from western China; with alternate, bright green, ovate, coarsely serrate leaves, 2 to $4\frac{1}{2}$ inches long; inconspicuous flowers in terminal, globular heads, about an inch in diameter; enormous white bracts surrounding the flowers; and ovoid, greenish yellow fruits with brown dots, about $1\frac{3}{4}$ inches long. In the British Isles this tree is quite hardy, and though it can be propagated by cuttings, the plants raised from seeds show the greatest vigor. (Adapted from Curtis's Botanical Magazine, vol. 138, plate 8432.)

Diospyros ebenaster Retzius. (Diospyraceae.) 44130. Seeds of **black sapote** from Honolulu, Hawaii. Presented by Mr. Gerrit P. Wilder. An ornamental Mexican tree with oblong-oval glossy leaves, about 4 inches long; and light green oblate fruits, up to 4 inches in diameter, with very dark brown sweetish pulp. (Adapted from note of Wilson Popenoe.)

Diospyros kaki L.f. (Diospyraceae.) 44108. Cuttings of **persimmon** from Kioshan, Honan, China. Presented by Dr. Nathannel Fedde, American Luthern Mission. "The

Honan red persimmon is about the size of the average tomato, and were it not for the large stiff calyx would be almost indistinguishable from it. Commonly no seeds occur, but some have as many as four or five. The taste is sweet almost to a fault, with no suggestion of pucker unless the core is eaten. The juice leaves a permanent stain in linen." (Fedde.)

Fagopyrum vulgare Hill. (Polygonaceae.) 44208. **Buckwheat** seeds from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer, November 25, 1916. "*Ch'iao mai,* meaning 'Triangular wheat'. Chinese buckwheat grown as late crop on poor lands and on mountain slopes. From the flour a very thin and brittle vermicelli is manufactured, from which a meal can be prepared within a few minutes." (Meyer.)

Ficus sp. (Moraceae.) 44116. Seeds from El Coyolar, Costa Rica. Presented by Mr. Carlos Wercklé. "This is very different from the rest of the genus in its being of superb form. It is a very large and very dense tree, of exceptionally beautiful color, and is evergreen. Nearly all the other species are bare for a longer or shorter time during the dry Season. Very much liked by birds, and always full of little parrots. Fruit and leaves very small. One of the most beautiful tropical trees. Plant in fibrous fern peat, or, in turf, with a little old mortar (ground) and a little charcoal dust; or, in common vegetable peat, with ground mortar (sand and lime) and charcoal dust." (Wercklé.)

Juglans mandschurica Maxim. (Juglandaceae.) 44233. Seeds of **Manchurian walnut** from Shinglungshan, Chihli province, China. Collected by Mr. Frank N. Meyer, December 3. 1916. "*Shan ho t'ao,* meaning 'Mountain or wild walnut,' occurring in Manchuria and Northern China, growing into a stately tree. The nuts are small and contain but little meat, but they are eagerly eaten by the people. The young foliage is very sensitive to frosts, and the tree can be grown successfully only in such localities where late frosts are of rare occurrence. Of value as a hardy shade tree; possibly also as a stock for Persian walnuts, in cold localities." (Meyer.)

Juglans regia L. (Juglandaceae.) 44199-44200. **Walnut** seeds from Peking, China. Collected by Mr. Frank N. Meyer, November 10, 1916. "Walnuts of large size,

said to come from the mountains west of Peking. Chinese walnuts seem especially adapted to semiarid regions with warm summers and dry cold winters." (Meyer.)

Juniperus chinensis L. (Pinaceae.) 44234. **Juniper** seeds from Peking, China. Collected by Mr. Frank N. Meyer, December 27, 1916. "*Pai shu.* Berries of the North Chinese juniper, a hardy, drought and alkali-resistant evergreen tree, living to be many centuries old. Especially suited for dry climates with winters not too severe." (Meyer.)

Phaseolus angularis (Willd.) W. F. Wight. (Fabaceae.) 44232. **Adzuki beans** from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer, November 25, 1916. *Hei hsiao tou* meaning 'Black small bean'. An adzuki bean of marbled, blackish color, used mostly to produce first quality beansprouts." (Meyer.) These beansprouts can be produced by putting the beans in an earthern crock well drained by means of holes in its bottom and keeping them moist until they sprout and produce roots 1½ inches long. These sprouted adzuki beans when blanched by immersion for a few minutes in boiling water and cooling in cold water make a delicious vegetable when fried in butter until they begin to brown. (Fairchild.)

Perilla frutescens (L.) Britton. (Menthaceae.) 44205. Seeds from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer, November 25, 1916. "*Su tzu.* An odoriferous annual, the seeds of which contain a great percentage of oil which is used in waterproofing paper and cloth. They are also fed to song birds in winter time. The young tops are employed in giving flavor to certain pickles." (Meyer.)

Picea meyeri Rehder & Wilson. (Pinaceae.) 44149. **Spruce** seeds from Shinglungshan, Chihli province, China. Collected by Mr. Frank N. Meyer, December 3, 1916. "A tall-growing spruce, often having bluish needles." (Meyer.)

Pisum sativum L. (Fabaceae.) 44231. Seeds of **peas** from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer, November 25, 1916. "*Wan tou,* meaning 'Ten thousand bean'. A small, white, garden pea, cultivated for human consumption. In winter these peas are often forced in hot, dark, moist rooms, and the sprouts eaten scalded." (Meyer.)

Psychotria bacteriophila Valeton. (Rubiaceae.) 44119. One root from Buitenzorg, Java. Presented by Mr. P. J. S. Cramer, Chief, Plant Breeding Station. A shrub, 2 to 3 meters (7 to 10 feet) high, native of the Comoro Islands, Madagascar. The elliptic or ovate-oblong, fleshy, dark green leaves are short-petioled, and usually thickly covered with the remarkable bacterial knots which, according to the researches of Zimmerman and Faber (See Plant Immigrants No. 121 p. 1003, S. P. I. 42767, for fuller description) play a similar role in the existence of the plant to that played by the root tubercles of the Leguminosae. These bacterial leaf knots gather nitrogen from the air.

Pyrus lindleyi Rehder. (Malaceae.) 44164-44168-44170-44174. Seeds and cuttings of **Chinese pears** from China. Collected by Mr. Frank N. Meyer. Among these are some of the best cultivated pears of northern China; most of them excellent keepers and all of value in breeding experiments.

Pyrus ussuriensis Maxim. (Malaceae.) 44151-44163. **Pear** seeds from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer. *Suan li,* meaning 'Sour pear'. A medium-sized Chinese pear, of globose form and of green color. Calyx persistent, length of peduncles varies considerably in different specimens. Flesh somewhat gritty and quite sour. These pears cannot be eaten raw, except after having been frozen, when they become melting. By cooking them, however, a sour sauce can be obtained which missionaries found acceptable as a substitute for sour apple sauce. Possibly these may also prove to be blight-resistant." (Meyer.)

Rhynchosia sp. (Fabaceae.) 44118. Seeds from El Coyolar, Costa Rica. Presented by Mr. Carlos Wercklé. "*Yellow vetch.* Small blooming annual forage plant, growing now in the dry season, while the yellow sensitiva (*Aeschynomene sp.*) (No. 44113) is completely dried up. After the yellow sensitiva, it is our best soil enricher." (Wercklé.)

Saccharum officinarum L. (Poaceae.) 44099. **Sugarcane** seeds from Cienfuegos, Cuba. Presented by Mr. Robert M. Grey, Harvard Experiment Station. "Seeds of one of my hybrid canes which is very prolific and germinates freely when sown in the open ground here." (Grey.)

Soja max (L.) Piper. (Fabaceae.) 44212. **Soybeans** from Malanyü, Chihli province, China. *Ch'ing tou,* meaning 'Green bean'. A green variety of soybean, often used as an appetizer with meals, when slightly sprouted and salted, or when fried and salted." (Meyer.)

Vigna sinensis (Torner) Savi. (Fabaceae.) 44218. **Cowpeas** from China. Collected by Mr. Frank N. Meyer. "*No ling tan chiang tou,* meaning 'Wren's egg precious bean'. A speckled variety of cowpea with white top. Cowpeas are in great favor with the Chinese as a human food; they are eaten boiled with rice, stewed in meat-dishes and cooked in soups; they are believed to promote speedy excretion of waste matter from the body." (Meyer.)

Zea mays L. (Poaceae.) 44204. Seed **corn** from Malanyü, Chihli province, China. Collected by Mr. Frank N. Meyer, November 25. 1916. "*Yu mi,* meaning 'Imperial rice'. A large-grained, yellow flint maize, cultivated on rich bottom-lands in the mountains." (Meyer.)

NOTES ON BEHAVIOUR OF PREVIOUS INTRODUCTIONS.

Abelmoschus esculentus (33749) Okra. An Egyptian Variety presented by Mr. E. A. McIlhenny. Mrs. Anna Breckwold of Hammond, Louisiana, in her letter of November 20, 1916, says: "No. 33749, okra, is the most prolific strain I ever saw. It is certainly doing well. I saved a great deal of seed as every one who saw it wanted some." Mrs. J. W. Clark of Georgetown, Texas, also says that the okra proved "all that the description claimed for it. My plants were full of pods when cut down by the freeze last week."

Abelmoschus manihot (18580) This plant (from Peking, China) is reported to have "flowered continuously with the seed pods cut off; blooms enormous, open blossoms were frozen on it." (Mrs. J. W. Clark, Georgetown, Texas.)

Aleurites fordii (27518) Tung-oil tree from China. A letter from Mr. F. D. Leaming, Little Rock, Arkansas November 14, 1916 states that his tung-oil tree received in 1912 bore this year nearly a bushel of fruits which made nearly a peck of nuts after the flesh was removed.

Aralia cordata (26565) Japanese Udo. Mrs. James Chamberlin of Spring Camp, Idaho, reports that "the udo planted has proven a valuable early vegetable. As rapidly as possible we will distribute roots of this plant to families who desire them."

Brassica pekinensis (36054) Mr. James Chamberlin, of Spring Camp, Idaho, reports that "the Chinese cabbage was a great success. As an early vegetable for greens we have nothing to equal it. Some planted in July weighed 28 to 30 lbs. per head or bunch. For this climate, and for the later winter keeping plants, the seed should be sown later than in July. We found it unnecessary to manure it when planted in an ordinary garden soil. We have distributed seed of the Chinese cabbage to many families, so that next season it will be a staple food in this locality." A letter from Mr. C. G. Warriner, Arlington, New Jersey, November 24, 1916, says "the leaves of *Brassica pekinensis* make the most tender and tasty salad we have ever had. I would call it a great addition to a late garden for that purpose irrespective of any other use and would like to grow a large amount of it next year."

Diospyros kaki (26773) Japanese Persimmon. Mr. H. H. Hume in letter of November 13, 1916, says: "I am very glad that No. 26773 pleased you. We think it is just a little the best thing we have found in persimmons yet. If we do not get another thing of value out of our persimmon work other than this we feel that we will be amply repaid. I suppose the name should really be reduced to Fuyu, yet I have a variety under that name which is not the same as Fuyugaki. If I remember correctly, we have 7 or 8 trees of this variety; one is a top-worked tree, the others root grafted. The variety attracted our attention last year and we immediately started in to propagate it with such propagating wood as we could secure from one individual tree. I think we have about 70 or 80 trees in the nurseries now and have about 500 dormant buds, inserted last August. It will probably take us another year before we can work up a stock of it of any considerable size."

Maytenus boaria (26323). A small leaved variety of the Chilean maiten, a tree on which horses and cattle browse in season of drought, and which is considered of value for its forage. "I received this from your

Department last spring. It looks a little like the live oak. You said that it made a good hedge or a large shade tree. I smiled at such a combination of qualities, but it is true. The plants all lived. I cut to 6 inches and now they are 5½ or 6 feet high - perfect evergreen, though we have had sudden drops to 14° F. I wish I had 10,000 of them." F. T. Ramsey, Austin, Texas. Feb. 8, 1917. Regarding this same Chilean tree Mr. A. P. Borden, of Pierce, Texas, wrote on July 23, 1917. "About twelve or thirteen years ago Dr. Galloway sent me from Washington, quite a number of shade and ornamental trees to try in this section. About the only one that survived and did well is an evergreen tree with a bushy top about twenty feet high, making a very dense shade. It is a pretty tree."

Mr. R. C. May of Miami, Florida, in letter of April 5, 1917, reports: "To my surprise the candle-nut (*Aleurites moluccana*), S. P. I. No. 40977, *Duranta repens*, S. P. I. No. 39458, and the *Myrciaria cauliflora* (Jaboticaba), S. P. I. No. 36702, are living and growing well. The candle-nut is quite hardy and as cold-resistant as the sweet orange. The Jaboticaba is about as cold-resistant as the lemon and the *Duranta repens* as the lime. I make these comparisons supposing you to be familiar with them. The temperature here was about 24° F."

Medicago orbicularis (10725). Button clover. "This leguminous crop which is proving valuable in California, is the subject of Farmers' Bulletin No. 730. The original seed was collected by Mr. T. H. Kearney of the Bureau of Plant Industry, from pods which he found on the stone pavement of the Temple of Aesculapius, at Lambesa near Timgad, Algeria. This handful of pods from a dry plant on the old temple floor has resulted since 1902 in the introduction of a crop which is preferable as a pasture plant to the spotted and toothed bur clovers, now used extensively, while it has practically the same value as these other bur clovers for green-manuring purposes." (Fairchild.)

Prunus tomentosa (36111). A Chinese bush cherry. These young cuttings of this number planted in 1914 have proved very hardy at Spring Camp, Idaho, and are said to have made a wonderful growth. The plant blossomed this spring but the fruit was killed by an unusually late spring frost.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Frank N. Meyer, Wilson Popenoe and F. C. Reimer, Agricultural Explorers.
H. C. Skeels, S. C. Stuntz, and R. A. Young, Botanical Assistants.
David A. Bisset, P. G. Russell, and G. P. Van Eseltine, Assistants
Edward Goucher, Plant Propagator.
Henry Y. Gouldman, Laboratory Aid.

Field Stations Scientific Staff.

R. L Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
R. S. Atwater, F. R. Livingstone, and D. M. Wallen, Field Station Aids.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Harry Duffield, Jr., Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
E. J. Rankin and C. H. Steffani, Field Station Aids.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
M. E. Batchelor and M. H. Lee, Field Station Aids.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
H. A. Houser and B. L. Peters, Field Station Aids.

Collaborators.

Aaron Aaronsohn, Haifa, Palestine; Thomas W. Brown, Cairo, Egypt; H. M. Curran, Laurel, Md.; M. J. Dorsey, University Farm, St. Paul, Minn.; Gustav Eisen, New York City; E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro; A. C. Hartless, Seharanpur, India; Barbour Lathrop, Chicago, Ill.; H. Nehrling, Gotha, Fla.; Miss Eliza R. Scidmore, Washington, D. C.; Charles Simpson, Littleriver, Fla.; H. P. Stuckey, Experiment, Ga.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; H. N. Whitford, School of Forestry, New Haven, Conn.; E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS

No. 132. APRIL, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Amaranthus	1145	Liquidambar	1149
Ampelopsis	1145	Lonicera	1150
Annona	1145	Malpighia	1150
Castanopsis	1146	Malus	1150
Catalpa	1146	Prunus	1150
Clerodendrum	1146	Pyrus	1151
Cunninghamia	1146	Rosa	1151, 1152
Dioscorea	1147	Solanum	1152
Drimys	1148	Styrax	1152
Docynia	1148	Viburnum	1152
Eleocharis	1148	Zea	1153
Ficus	1149	Zinziber	1153

Plates:

Pl. 215. A collection of Guatemalan Chayotes, *Chayota edulis.*

216. A Chayote Arbor in a Guatemalan village.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 21, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Amaranthus gangeticus L. (Amaranthaceae.) 44566. **Amaranth** seeds from Peking, China. Collected by Mr. Frank N. Meyer, February 17, 1917. "A red Amaranth, used locally as a vegetable, like spinach, when young. Sometimes the seed is sown in a moist, dark, warm place; and the young, red-colored seedlings are eaten as a rare delicacy at feasts. The seed itself is apparently never used in the north of China as a grain food. Chinese name *Hung hsien ts'ai,* meaning 'Red hsien vegetable'." (Meyer.)

Amaranthus paniculatus L. (Amaranthaceae.) 44469. **Amaranth** seeds from San Juan Batista, Tabasco, Mexico. Purchased from Mr. Cabriel Itié, Director, Agricultural Experiment Station. "*Alegria* is produced in Tlajomulco, Zacoalco and San Pedro Tlaquepaque, districts belonging to the state of Jalisco. This annual is sown in nurseries; in the month of December it is harvested and is used in the making of sweets. I was told that the seeds in question are found with difficulty in the pueblos near Guadaljara, for the inhabitants do not put them to any practical application and if they are sometimes used, it is when they are mixed with dulce for children; they are surely very insipid. They are also seen in the state of Michoacán, where they are used for the same purpose." (Itié.)

Ampelopsis aconitifolia Bunge. (Vitaceae.) 44549. Seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A very handsome vine from northern China, with finely divided foliage. The leaves are 5-parted and 2 to 3 inches long; the inconspicuous flowers appear in summer; and the small orange berries mature in autumn. It should be planted where only a light covering is desired, and is hardy in the northern United States. (Adapted from L. H. Bailey, Standard Cyclopedia of Horticulture, vol. 1, p. 278.)

Annona (cherimola x squamosa) x reticulata. (Annonaceae.) 44671-44673. **Cuatemoya** cuttings from Lamao, Bataan, Philippine Islands. Presented by Mr. P. J. Wester, Horticulturist, Lamao Experiment Station. Obtained by the pollination of an atemoya (*A. cherimola x squamosa*) by a custard-apple (*A. reticulata*). The fruit is well shaped but rather small, about the size of a sugar-apple, with a yellowish green, almost glabrous surface; very thick tough skin; and white, tender melting, juicy,

subacid, aromatic flesh of excellent flavor. (Adapted from P. J. Wester, Philippine Agricultural Review, February, 1914.)

Castanopsis sclerophylla (Lindl.) Schottky. (Fabaceae.) 44663. Seeds from Nanking. An evergreen tree, 25 to 65 feet tall, growing in woods of Hupeh and Chekiang, China, at elevations up to 1500 m. (5000 feet). It is a handsome tree with nearly smooth, dark gray bark, and a densely-branched flattened crown. The natives gather the small chestnut-like nuts and crush them, making an edible paste resembling bean-curd in appearance and the chinkapin in flavor. (Adapted from C. S. Sargent, Plantae Wilsonianae, vol. 3, p. 201, 202, 1916.)

Catalpa bungei C. A. Meyer. (Bignoniaceae.) 44664. Seeds from Nanking, China. Presented by Prof. Joseph Bailie, University of Nanking. A quickly-growing Chinese tree, up to 100 feet in height and with a trunk 10 to 15 feet in diameter a few feet above the ground. The wood, which is strong, light, durable and non-warping, resembles walnut to a large extent and is much in demand for fine furniture. The tree might be cultivated in the semiarid sections of the United States where the winters are not too severe. It prefers a porous soil, and is easily propagated from suckers which spring up from the roots that are near the surface of the ground. (Adapted from note of Frank N. Meyer.) Not the dense round bush ordinarily grown as *C. bungei* Hort.

Clerodendrum trichotomum fargesii (Dode) Rehder. (Verbenaceae.) 44533. Seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A Chinese shrub, 3.5 to 4 meters (10 to 15 feet) in height; with dark green, oval, lance-shaped leaves, 10 to 15 cm. (4 to 6 inches) long; very fragrant, light pink flowers in axillary cymes; and dark purple drupes, 4 to 5 mm. (1/5 inch) in diameter, with very hard, black seeds. It is easily raised from seed, in ordinary soil. (Adapted from J. Pinelle, in Revue Horticole, vol. 83, p. 522-523, under *C. fargesii.*)

Cunninghamia lanceolata (Lamb.) Hooker. (Pinaceae.) 44665. Seeds from Nanking, China. Presented by Prof. Joseph Bailie, University of Nanking. "This handsome tree is found all over the temperate parts of China

from sea level up to 2000 m. altitude, but does not occur where the winters are severe. It is abundant in Fukien, Hunan, and Hupeh, and more especially so in western Szechwan where it is partial to red sandstone and forms pure forests. The trunk is mast-like; the branches numerous, slender, short, and horizontally spreading, giving a lax, pyramidal appearance to the tree. The leaves, usually dark green above, are frequently more or less glaucescent. After felling, sprouts spring from the old stumps and develop into new trees. This peculiarity explains why this tree is still common in regions near densely populated areas. Cunninghamia is the *Shan shu* of the Chinese, and is esteemed the most useful of all their timber trees. The wood is fragrant, soft, and easily worked; and is extensively employed in all branches of carpentry, in general construction work for pillars and planking, and as masts for native boats. It is also the principal coffin wood of central and western China, the fragrant properties being considered to act as a preservative. In parts of western Szechwan, notably in the Chienchang valley of the Tung river, a few days' journey west of Fulin, whole forests of this tree were engulfed by an earthquake two or three centuries ago. The wood of these trees is today mined and furnishes the most valuable of all coffin material. From these logs, known as *Hsiang-mu*, 'fragrant wood', or *Yin-chen-mu*, 'long-buried wood', planks of huge size can be cut, and a coffin made of them sells for a thousand to fifteen hundred ounces of silver. This buried wood is pale brown, close in texture, but easily worked and pleasantly fragrant. Trees of this conifer, equalling in size those buried giants, cannot be found in China today except as rare and isolated specimens associated with temples or shrines." (C. S. Sargent, Plantae Wilsonianae, vol. 2, p. 51-52, 1914.)

Dioscorea sp. (Dioscoreaceae.) 44588. **Yam** tuber from Ogbomosho, Nigeria, West Africa. Presented by Dr. George Green. The natives plant yams following a good shower in the summer or dry season (November to March). Such a storm usually comes about the end of January. The yams are cut cross-wise into sections about three inches thick, and these sections are cut longitudinally. Only 1 piece is planted, about 4 inches deep, in each of the hills or heaps, which are about 3 feet in diameter, 2 feet in height, and 4 feet apart. A tuft of grass is placed on top of the hill to protect the

planted yam from the sun, and soil is thrown on to prevent the wind blowing the grass away. The vines are supported by stout sticks or often by broken cornstalks. Yams require about 6 months to mature, those planted in January being ready for digging in July. Yams may be left in the ground for a week or two after the vines have died down. (Adapted from note by Green.)

Drimys granatensis Mutis. (Magnoliaceae.) 44701. Seeds from Bogota, Colombia. Presented by Mr. M. T. Dawe, Director, Estacion Agronomica, San Lorenzo, Tolima, Colombia. A white-flowered evergreen shrub, 5 to 12 feet in height; with few branches, and oval-oblong leathery leaves with rounded ends. The few-flowered umbels appear near the ends of the branches, and the obovate fruit is berry-like, ¼ inch long, with succulent flesh enclosing the numerous seeds. From the crushed leaves a tonic is prepared, the bark is the basis of an aromatic tonic, and the dried fruits are used as a spice. (Adapted from M. A. de Saint-Hilaire, Plantes Usuelles des Brasiliens, plates 26-28, 1824.)

Docynia delavayi (Franch.) Schneider. (Malaceae.) 44677. Seeds from Yunnanfu, Yunnan, China. Purchased from Mr. Frank Pilson. An ornamental evergreen, spiny tree, up to 30 feet in height; with glossy, ovate-lanceolate leaves, 2 to 4 inches long; and umbels of white flowers which appear in the spring. The fruit is an ovoid pome about an inch long. The tree is a native of southwestern China, and has recently been introduced into the United States. The fruits are more or less acid and are used for cooking. They could possibly be improved by selection and hybridization. The tree is propagated by seeds, and might possibly be grafted on apple stock. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 1063.)

Eleocharis tuberosa (Roxb.) Schultes. (Cyperaceae.) 44573. Tubers from Yokohama, Japan. Purchased from the Yokohama Nursery Company. They are mostly eaten raw, but are also sliced and shredded in soups, and in meat and fish dishes. Foreigners in China grate them and serve them as a winter vegetable, in which state they resemble sweet corn very much in looks and taste. The plants need a hot summer to mature and are grown on a muck or clayey soil with several inches of standing water on top, very much in the same manner

as wet land rice. (Adapted from Notes by F. N. Meyer.) According to Mrs. Yamei Kin this water chestnut is planted in hills 3 ft. apart in soil enriched by hog manure and after the plants have started well then they are flooded and kept flooded until the frost cuts back the foliage then the water is drained off and the hills are dug with a broad bladed hoe and the tubers taken out of each hoe full of mud.

Ficus carica L. (Moraceae.) 44472. **Fig** plants from Granada, Spain. Purchased from the Pedro Giraud Nurseries, through Mr. Percival Gassett, American Consul, Malaga. "*Isabeles*, the most delicious fig and much sought after." (Gassett.)

Ficus pseudopalma Blanco. (Moraceae.) 44470. Seeds from the Philippine Islands. Presented by Mr. Elmer D. Merrill, Acting Director, Bureau of Science, Manila. "A single fruit of *Ficus pseudopalma* which apparently has fertile seeds. This fruit was recently sent to me from Corregidor. The species is a most striking ornamental and will probably thrive out of doors in southern Florida and in southern California, and is well worthy of cultivation in greenhouses. The stems are erect, unbranched, and usually about 3 cm. in diameter. The stem is tipped by a dense crown of very characteristic leaves which is sometimes nearly a meter in length. The fruits are born in the leaf axils. On account of its palm-like aspect Blanco selected the name *pseudopalma;* the common Tagalog name is *niogniogan* which literally means little coconut." (Merrill.)

Liquidambar formosana Hance. (Hamamelidaceae.) 44666. Seeds from Nanking, China. Presented by Prof. Joseph Bailie, University of Nanking. A handsome tree, 20 to 40 m. (65 to 130 feet) in height, with a straight trunk, a much-branched head, and frequently buttressed roots. The leaves turn to a chestnut-brown or red in the autumn, and are retained late into the winter. In juvenile plants the trees are 5-lobed, while in the adult trees the leaves are only 3-lobed and are smaller. In Kiangsi the wood is used for making tea-chests. This is one of the most widely distributed trees in China, being particularly abundant in western Hupeh; and it is cultivated in Japan. (Adapted from C. S. Sargent, Plantae Wilsonianae, vol. 1, p. 421-422, 1913.)

Lonicera standishii Carrière. (Caprifoliaceae.) 44537. **Honeysuckle** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A charming, early-flowering shrub, with pale yellowish brown branches; pale green, nearly oval, deciduous leaves, 3 to 5 inches long; and white, sweet-scented flowers, 1/5 to 1/2 inch long. (Adapted from Curtis's Botanical Magazine, vol. 94, plate 5709.)

Malpighia punicifolia L. (Malpighiaceae.) 44458. Seeds from Curacao, Dutch West Indies. Collected by Mr. H. M. Curran. A shrub, native of the Dutch West Indies, about 12 feet high, with smooth, oval leaves, 4 cm. (1 3/5 inches) long; flowers in the axils of the leaves; and edible stone fruits. In some of the islands this is called cherry. (Adapted from I. Boldingh, Flora voor de Nederlandsch West Indische Eilanden, p. 239.)

Malus sp. (Malaceae.) 44577. **Apple** trees from Yokohama, Japan. Purchased from the Yokohama Nursery Company. "A variety of apple known in Japan as the *Iwai* or *Nakanaruko.* This variety is supposed to have come from this country, but it has also been said that it is of German origin. It has become a leading fall variety in Japan." (J. K. Shaw, pomologist, Massachusetts Agricultural college.)

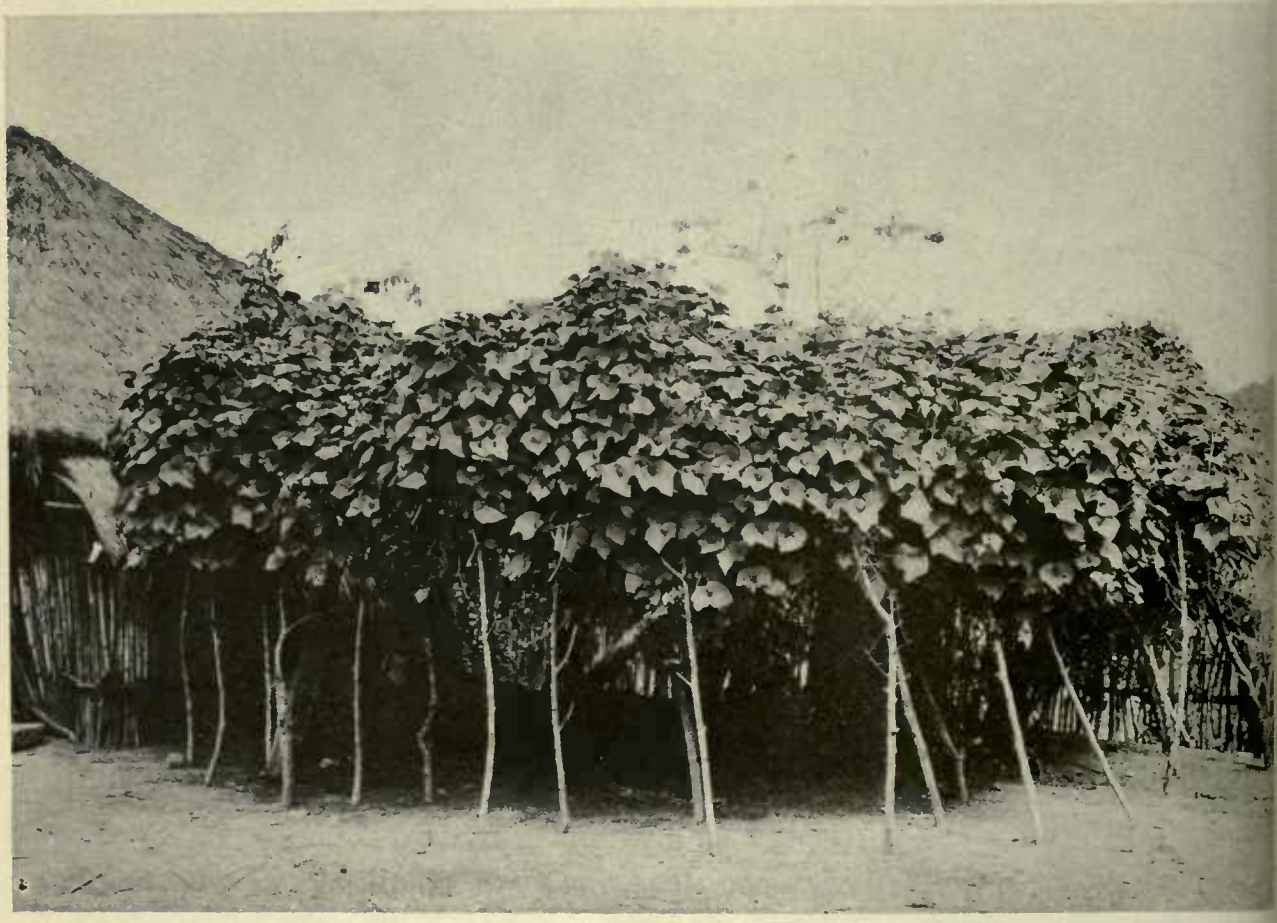
Prunus conradinae Koehne. (Amygdalaceae.) 44538. **Cherry** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A graceful tree from central China, reaching a height of 25 feet, with oval or oblong, doubly serrate leaves, 2 to 6 inches long; whitish or pink flowers, about 3/4 inch long, in 2 to 4-flowered umbels; and red, ovoid fruits, 1/3 to 1/2 inch long. (Adapted from A. Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2840.)

Prunus tomentosa Thunberg. (Amygdalaceae.) 44539. **Cherry** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A broad, vigorous shrub from northern China, one of the earliest cherries to flower. The flowers are large, with the white petals more or less tinged with red toward the base; and the small, bright red, slightly hairy fruits are of good flavor. It is now being cultivated in the northwestern parts of the United States, and in south-

A COLLECTION OF GUATEMALAN CHAYOTES.

(*CHAYOTA EDULIS* JACQ., *S. P. I. NOS. 43393–43401.*)

Mr. Wilson Popenoe has sent in from the city of Guatemala a very interesting collection of the types of chayote which are grown there. It is particularly interesting to observe the variation in this fruit, since there is only one species known in the genus. It would appear to be a very old cultivated plant in Guatemala. It is still an open question whether the smooth types of fruit with scarcely any longitudinal furrows, although more convenient for cooking, will yield as abundantly or have as fine a flavor and texture as the furrowed form already growing in Florida and Louisiana. (Photographed by E. L. Crandall, October 11, 1916; P20016FS.)



A CHAYOTE ARBOR IN A GUATEMALAN VILLAGE.

It is important to realize that in its native home, Guatemala, the chayote, or "güisquil," as it is called there, is one of the most important vegetables grown. It is cultivated on low arbors much like those used for the Scuppernong grape in our Southern States. To the Guatemalans it is what a perpetual cucumber vine would be to Americans. (Photographed by Wilson Popenoe at Santa Maria de Jesus, Guatemala, October 20, 1916; P16878FS.)

western Canada, where other cherries are not hardy. (Adapted from the Arnold Arboretum Bulletin of Popular Information, No. 19, April 25, 1912.)

Pyrus sp. (Malaceae.) 44674-44675. **Pear** cuttings from Ningpo, China. Obtained by Rev. L. C. Hylbert, American Baptist Mission, through Rev. G. W. Sheppard, English Methodist Mission. These cuttings were sent in response to a request for propagating material of certain pear trees growing on the Island of Chusan which produce immense fruit. Mr. Hylbert reports that "the cuttings were secured from a gentleman's garden, and are said to be beyond price."

Rosa banksiae normalis Regel. (Rosaceae.) 44544. **Rose** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. "This Rose is very abundant in western Hupeh and eastern Szechwan from river-level to 1000 m. altitude and is fairly common in western Szechwan in the valleys of the Tung and Min rivers and neighboring regions up to 1500 m. altitude. It delights in glens, ravines and rocky places generally, where it forms tangled masses 6 m. and more high, and as much in diameter; commonly it rambles over trees, and Wilson has seen trees 15 m. and more tall, completely festooned with this Rose. The flowers are always pure white, and we have never observed any tendency towards double flowers in the wild plant; nor did Wilson see it or any of its forms cultivated in gardens in central or western China. The umbellate inflorescence well distinguishes this species from its nearest relation *Rosa microcarpa* Lindley. The root-bark is used locally for strengthening fish nets and dyeing them brown." (C. S. Sargent, Plantae Wilsonianae, vol. 2, part 2, p. 317.)

Rosa moyesii Hemsley & Wilson. (Rosaceae.) 44545. **Rose** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. Forma *rosea* Rehder & Wilson. An upright bush, found in western Szechwan, China, up to 3300 m. (11,000 feet) elevation, growing to a height of 1 to 5 m. (3 to 16 feet), and distinguished from the typical species by its large leaves and large pale pink flowers. The large fruits are either dull red or scarlet. (Adapted from C. S. Sargent, Plantae Wilsonianae, vol. 2, part 2, pp. 325, 326.)

Rosa rubus Leveille & Vant. (Rosaceae.) 44546. **Rose** seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A climbing shrub, common everywhere in western Hupeh and eastern Szechwan, China, from river-level to an elevation of 1300 m. (4200 feet.) It is readily distinguished from its near relatives by the densely hairy shoots and leaves, and grows to a height of 2.5 to 4 m. (8 to 13 feet), with dull red, globose fruits. (Adapted from C. S. Sargent, Plantae Wilsonianae, vol. 2, part 2, pp. 308, 309.)

Solanum tuberosum L. (Solanaceae.) 44580. **Potato** tubers from Bogotá, Colombia. Presented by Mr. Jorge Ancizar. *Papa criolla,* or Creole potato. The tubers are shaped like those of the common potato but are only about an inch in the shortest diameter. They are said to mature in three months; and are reported to be delicious when fried in their skins.

Styrax wilsonii Rehder. (Styracaceae.) 44595. Plants from Orléans, France. Purchased from Messrs. Léon Chenault & Son. A very ornamental, deciduous shrub, 6 to 10 feet high; native of western China. Twiggy and much-branched, with ovate, green leaves, $\frac{1}{2}$ to 1 inch long, usually entire but sometimes with the ends 3-lobed or sparsely toothed. The solitary, nodding flowers are pure glistening white, $\frac{5}{8}$ to $\frac{3}{4}$ inch wide, and are produced in June on short stalks from the leaf-axils. The shrub is remarkable in that it begins to flower when only a few inches high and two or three years old. It is probably hardy as far north as Philadelphia. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 560, and from A. Rehder, in Bailey, Standard Cyclopedia of Horticulture, vol. 6, p. 3279.)

Viburnum kansuense Batalin. (Caprifoliaceae.) 44547. Seeds from Ventimiglia, Italy. Presented by the Superintendent, La Mortola Botanic Gardens. A tall Chinese shrub, of loose and open habit, found at elevations of 6000 to 9000 feet. It has oblong leaves, and juicy, red berries which are used in making agreeable drinks. (Adapted from note of Frank N. Meyer, May 11, 1915.)

Zea mays L. (Poaceae.) 44564. Seeds from Rosario, Argentina. Presented by Mr. William Dawson, Jr., American Consul. *Maiz amargo.* A so-called "bitter corn," grown in the Chaco region of Argentina as a locust-proof variety. Otherwise it seems to have no advantages, as the yield is but one-fourth to one-half that of other varieties and the development is extremely slow, requiring from nine to ten months to mature.

Zinziber mioga Roscoe. (Zinziberaceae.) 44579. Roots from Yokohama, Japan. Purchased from the Yokohama Nursery Company. A perennial Japanese herb about 3 feet high, with nearly linear, smooth, membranous leaves, up to 15 inches long; white flowers in spikes, 2 to 3½ inches long; and ovoid capsules. It occurs wild and also in cultivation. In summer and autumn the flowers, with the bracts, are eaten, either raw or boiled; they have a slightly acid taste and an aromatic odor. (Adapted from Useful Plants of Japan, p. 30, and from F. Tracy Hubbard, in Bailey, Standard Cyclopedia of Horticulture, vol. 6, p. 3544, the former under *Amomum mioga.*)

Notes from Correspondents abroad.

Mr. Eugene André writes from Port-of-Spain, Trinidad, B.W.I., October 22, 1917:

"I enclose two bulletins of our Department of Agriculture. Part 1, Vol. 16, pages 18-20, gives the results of certain experiments made by the Government in 1915-1916 with the object of acquiring definite knowledge as to the yield of the various kinds of cassava grown by our peasantry. The spot where the experiments were conducted forms part of the old St. Augustine Sugar estate, one of the oldest estates in the island. Bulletin Part 2, Vol. 16, deals with other matters connected with the cassava industry here. Unfortunately, the inhabitants of Carenage, in spite of the inducements offered to them, would not take up the growing of cassava on a scale that would have kept the factory busy, so that this part of the enterprise has been a failure. Speaking generally, comparatively little cassava is grown here. The laboring man has got used to his wheaten loaf and he turns his nose up at the disks of cassava which is the staple of the Venezuelan poor. Like cassava corn is but little used as a bread, but corn is more widely grown than cassava because it is the food generally given to our domestic

fowls, ducks, etc. In addition to what is grown locally much corn comes from the neighboring mainland. This is eagerly bought up as we do not grow nearly enough to supply our wants. The present price is $2.60 per bag of 110 pounds. In times of scarcity prices range from $3.50 to $5.00 per bag. We are large importers of rice, although of late years local production has been steadily increasing. Up to within a few years we did not grow a single pound of this cereal in spite of the fact that several hundreds of square miles of land in different parts of the island are as fine ricelands as can be found anywhere in the world.

"The whole fact of the matter is that our agriculture and food problems are largely artificial, if I may put it so. The sugar, cacao, and coconut people are interested in exportation not in production for local consumption. The importing merchant would be very sorry to see cassava and corn replace flour from the United States and Canada, which means that neither of these valuable foods is cultivated on a scale that would enable me to give you such definite information as would be of use for your tropical possessions.

"It is only since the war that the dasheen has come into prominence in Trinidad, the high prices of flour, imported, so-called Irish potatoes, and other vegetables having contributed to this. Today, dasheens are being eaten in houses where the very name was unknown a couple of years ago. Formerly, dasheens were sold as cheap as a cent or a cent and a half per pound, now housekeepers consider themselves in luck if their cooks can get them dasheens at three cents. Whether a popular flour for bread-making will ever be prepared from it is a doubtful question; but there is no doubt about its having become a popular vegetable, which it was not before. Two varieties are being grown here; a white and a purplish; the latter looking, when boiled, like blue-mottled soap. The white is preferred. Our Forest Department is making some experiments with dasheens in the Southern District where a twenty-acre block at the Central Range Reserve has been planted up with them as a cover crop for the seedlings of cypress, cedar, and teak, which are being grown there. I suppose something will be published on the subject later on. I shall look out for it and send a copy along to you.

"Years ago, you were kind enough to send me a couple of plants each of *Trapp* and *Pollock* avocados, of which one of each has grown into quite a good-sized

tree. For the last three years they have fruited profusely. *Pollock* is by far the better of the two and is, to my mind, the best avocado I know of."

Mr. Frank N. Meyer writes from Kingmen, Hupeh, China, September 27, 1917:

"To get exact temperatures of places here in central China where the Tung oil tree occurs, is a very hard matter. Around here in Kingmen, there are several trees and last winter the ice was 7 to 8 inches thick. Mr. Joel S. Johnson, a Swedish-American missionary here, estimates that it probably was 10° above zero for several nights this past winter. In the mountains, however, it must have been zero and yet, even there one finds Tung oil trees. Of course, we here in China do not have cold waves like America experiences them. Temperatures rise and fall very gradually. It is the sudden falls of the mercury that do the damage.

"I'll try to get more information regarding quality of oil from various localities. Strange, that Californian oil indicated adulteration. Could a semi-arid, subtropical climate produce that effect? Here is what I have found out; climate makes or destroys a race; after climate, soil influences most; after soil surrounding influences come and last of all the original stock tells.

"Your statement that out of Tung oil a valuable rubber-substitute is made, brings up an interesting point which I have not told you yet. This is the thing:

"After I had given a lecture in the church of the missionary community at Mokanshan, Chekiang Province, in July, 1915, a number of people came around me and told me various experiences. One missionary from South Chekiang informed me that once having been out in the country he had his long rubber boots with him for many weeks. Upon coming back these boots had been packed up roughly and deposited somewhere and forgotten. After many months' lapse this missionary found them and he discovered to his dismay that they had bad cracks in them just above the ankles. Just as he was intending to cut them off, so as to save the nether parts for goloshes, his servant said to him, 'Don't do this, I can have them repaired for you!' 'Well, the missionary said, 'even we white folks do not know how to repair rubber boots so that they are reliable, so how could Chinese do it who haven't even got rubber?' But he allowed his man to have them re-

paired and when they came back, after some weeks' time, they had strips of glue-like material upon them and were absolutely waterproof; later on other parts of the boots became again cracked, but these repaired places remained as elastic as ever. When asking what wonderful material this was, his servant told him it was *Tung yu.* This missionary added that if he were a commercial man, this discovery might have made him a wealthy fellow in a short time. So here you have something to make a fortune with!"

"You ask me whether there is a simple flavoring to take away the beany taste of beancurd. No, there is not! The Chinese are of course used to this peculiar paint or putty-like flavor, but even then they often season their beancurd dishes highly with salt and chili peppers. I have noticed though that the curd in some towns tastes much better than in others and I found that greenish yellow soybeans have a coarser taste and flavor than the light yellow ones. I have some idea that the quality of oil has something to do with this characteristic. If I were you I would try to cook with superheated steam for a considerable time and see if that does not remedy the matter considerably. Remember that the Boston baked beans need a whole night and morning of slow heat before they really are 'tasty'.

"You also might try to de-fatten the beans, before making them into curd. Before doing so, first see whether bean cake can be used for making curd; if so, we are on the road to kill 2 birds with 1 stone.

"Whether there are more vegetable seeds that can be sprouted and used as vegetables? Well, here are some that I came into contact with:

"*Phaseolus angularis,* Adzuki bean, the speckled grayish black variety supplies the finest quality of beansprouts, of very sweet and juicy flavor. The red varieties are boiled, pounded with sugar and used as a filling in cakes and as sweetmeats.

"*Phaseolus aureus,* Mung bean, the ordinary sea-green variety supplies good beansprouts, vermicelli and gelatine, also much eaten boiled with rice as a broth or gruel.

"*Soja max,* the small green and yellowish green varieties are sprouted, but the sprouts have a rank flavor; the large green varieties are allowed to germinate only or often not even that and are fried in oil and some salt sprinkled over them; they are very

appetizing. Often they are served with bits of raw, chopped-up carrots in between, creating a dish pleasing to the eye.

"From the small yellowish green soybeans, beancurd is made in all its forms. The large yellow varieties are used for oil production.

"Broadbeans, *Vicia faba,* are in winter and spring soaked in water over night, often even allowed to germinate and are fried in oil and salt sprinkled over them and eaten like salted peanuts.

"Peas, *Pisum sativum,* brown and yellow varieties are in wintertime soaked in water over night and steamed or fried in oil, sprinkled over with a bit of salt and eaten as a vegetable; flavor excellent. When the peas have made sprouts of 2-4 inches long, they are scalded and eaten like spinach, pea and sprouts left attached; they do not taste very fine. From water-soaked ground peas a gelatine is made, much eaten in summer, resembling a primitive form of 'blanc mange'.

"Mustard seed, *Brassica juncea,* in wintertime is sown out in warm, moist and dark places and the tiny plants eaten with brown sugar sprinkled over them.

"*Amaranthus blitum* and *A. tricolor* are eaten the same way. Chives, *Allium schoenoprasum,* are forced in dark, warm places and eaten in soups, with meats and baked in extremely thin pancakes, made from yellow soybean flour. They are considered, together with the garlic, to prevent ptomaine poisoning. Of all these forced winter vegetables the *Mung bean* is the most commonly used, on account of cheapness and availability, but in my opinion the *Adzuki beansprout* is the best. There is a future in breeding fine varieties of *Vigna sinensis* and *Vigna sesquipedalis:* they stand moist heat and drought at the same time and can be made to bear throughout the whole summer. *Ipomoea aquatica* is, like *Tetragonia expansa,* a summer spinach; it loves moist soils. The Wax-gourd, *Benincasa cerifera,* is like the chayote, a good late summer and winter vegetable. After I have been in Southern China, I may have some more things to write about. Did you have a look at my photographs of soybean products? I hope they have given you, and others, some ideas how big an affair the soybean is in the daily life of one fourth of the world's population and if the white races do not soon stop committing suicide, these people will, by the year 2000, constitute one third of the earth's inhabitants."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Frank N. Meyer, Wilson Popenoe and F. C. Reimer, Agricultural Explorers.
H. C. Skeels, S. C. Stuntz, and R. A. Young, Botanical Assistants.
D. A. Bisset, R. N. Jones, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.
Henry Y. Gouldman, Laboratory Aid.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Harry Duffield, Jr., Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Aaron Aaronsohn, Haifa, Palestine; Thomas W. Brown, Cairo, Egypt; H. M. Curran, Laurel, Md.; M. J. Dorsey, University Farm, St. Paul, Minn.; Gustav Eisen, New York City; E. C. Green, Serviço do Algodao no Brazil, Rio de Janeiro; A. C. Hartless, Seharanpur, India; Barbour Lathrop, Chicago, Ill.; C. C. Logan, Luray, Va.; H. Nehrling, Gotha, Fla.; Miss Eliza R. Scidmore, Washington, D. C.; Charles Simpson, Littleriver, Fla.; H. P. Stuckey, Experiment, Ga.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; H. N. Whitford, School of Forestry, New Haven, Conn.; E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

RECEIVED
MAY 16 1918
Bureau of Forestry
University of California

BUY LIBERTY BONDS.

DON'T FORGET IN YOUR SECLUSION THAT THE WORLD OF HUMAN BEINGS IS BURNING UP. THE LEAST YOU CAN DO IS TO LEND YOUR LAST CENT TO YOUR COUNTRY.

PLANT IMMIGRANTS.

No. 133. MAY, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Allium	1161	Lactuca	1165
Annona	1161	Malus 1165, 1166,	1167
Brassica 1161,	1162	Nannorhops	1168
Bromelia	1162	Olea	1168
Campomanesia	1162	Pandanus	1168
Corynocarpus	1163	Phaselous	1169
Cryptostegia	1163	Pistacia	1169
Gladiolus 1163, 1164,	1165	Raphanus 1169,	1170
Jasminum	1165	Solanum	1171
		Ziziphus	1171

Plates:

Pl. 217. The Anay, a wild relative of the Avocado, *Persea sp.*
218. A fruit and seed of the Anay, *Persea sp.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

May 1, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Allium triquetrum L. (Liliaceae.) 44793. Sets from Mustapha-Alger, Algeria. Presented by Dr. L. Trabut. A bulbous plant with a 3-angled stem, common on the coast of Algeria. In its usual surroundings this plant is a rather dwarfed weed of dry texture, but it has now been found that when it is transplanted to good garden soil with plenty of fresh water it produces, during the winter, large plants with white, tender and succulent underground parts. If the green leaves are removed, the rest of the stem forms a delicate vegetable with no odor of garlic. (Adapted from Trabut, Revue Horticole, July 1, 1913, pp. 311, 312.)

Annona testudinea Safford. (Annonaceae.) 44774. Seeds of a **tortoise-shell custard-apple** from Guatemala. Collected by Mr. Wilson Popenoe. "The tortoise-shell custard-apple, from the town of El Rancho, in eastern Guatemala. It may not have been grown at this place, as it was purchased in the market, but it was probably grown somewhere in the immediate vicinity. This interesting *Annona* belongs to the section Chelonocarpus, or Hard-shelled Custard-apple group, established by Safford (Journal of the Washington Academy of Sciences, vol. 3, No. 4, Feb. 19, 1913). The tree, which has not been seen by me, is described as being 12 to 15 meters high, with oblong or oblong-elliptic leaves, acuminate at the apex, and 25 to 35 cm. long. The fruit is more or less globose in form, about 4 inches in length, with a hard shell divided on the surface into polygonal areoles by slightly raised ridges. It strongly resembles the common custard-apple, being dull green, and somewhat pruinose. The seeds, however, are quite different from those of the common custard-apple, (*Annona reticulata*), being considerably larger and pointed at the apex. The flesh is white, soft, watery, free from the grittiness which is so objectionable in *A. reticulata*, sweet and of pleasant flavor. The pulp does not adhere to the seeds in the ripe fruit. This species seems worthy of a trial in South Florida. It will probably be too tender for cultivation in California, unless in the most favored locations such as Santa Barbara." (Popenoe.)

Brassica napus dichotoma (Roxb.) Prain. (Brassicaceae.) 44788. **Tori** or **Indian rape** seeds from Ranchi, India. Presented by Mr. A. C. Dobbs, Deputy Director of Agriculture, Chota Nagpur Division. These seeds were sent in response to a general request for all *Brassica*

Remember that four one-thousand dollar Liberty Bonds will buy one tractor.

varieties used for the production of mustard. An annual plant cultivated throughout India, especially in the lower provinces for rape seed production. There are two forms: one tall and rather late, the other shorter and very early. The seeds are usually brown and of the same size as those of the *sarson* (*B. campestris sarson*). The oil-content is very variable. (Adapted from Watt, Commercial Products of India, p. 178–180.)

Brassica campestris sarson Prain. (Brassicaceae.) 44787. **Sarson** seeds from Ranchi, India. Presented by Mr. A. C. Dobbs, Deputy Director of Agriculture, Chota Nagpur Division. These seeds were sent in response to a general request for all *Brassica* varieties grown for mustard. An erect annual of rigid habit, cultivated in many places in India for the seeds. There are two forms; one with erect pods and one with pendent pods, the former being the true *sarson,* and the latter being found commonly only in northern Bengal and eastern Tirhut. The seed is sown in September, either broadcast or in parallel lines, usually with wheat or barley, and the plants are cut soon after the harvest of the associated crop. *Sarson* is very liable to be attacked by insects and blight, and is quite susceptible to climatic vicissitudes. (Adapted from Watt, Com-Products of India, p. 176–178.)

Bromelia chrysantha Jacq. (Bromeliaceae.) 44796. Seeds from Venezuela. Presented by Mr. Henry Pittier. "This has been called *B. chrysantha,* but it may be simply *B. pinguin.* The fruit, which is sweet acidulous and quite agreeable to the taste when mature, is sold in the market." (Pittier.)

Campomanesia fenzliana (Berg) Glaziou. (Myrtaceae.) 44784. **Guabiroba** seeds from Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director, da Escola Agricola de Lavras. A small Brazilian tree with foliage remarkably similar to that of some of the European oaks. It is usually 20 to 25 feet in height, though occasionally taller. The fruits greatly resemble small guavas, being orange-yellow, oblate in form, and up to an inch in diameter. The skin is thin and encloses a layer of granular, light yellow pulp, which has a flavor somewhat stronger than that of the guava. The fruits are used principally for making jam and jellies. The tree should prove suitable for southern California and southern Florida. (Adapted from note of Dorsett, Shamel, and Popenoe.)

Remember a one one-thousand dollar Liberty Bond will furnish pistols for the men in a rifle company.

Corynocarpus laevigata Forster. (Corynocarpaceae.) 44745. **Karaka** seeds from Auckland, New Zealand. Presented by Mr. H. R. Wright. A handsome evergreen tree with glossy, laurel-like, oblong leaves, 3 to 7 inches long; erect panicles of small white flowers, 4 inches in length; and oblong, orange-colored fruits an inch long. The outside of the fruit is extremely poisonous, but the kernel is edible and forms one of the staple foods of the Maoris, who cultivate the tree for its seeds. The wood has been much used by the natives of the Chatham Islands in making of canoes. (Adapted from Laing & Blackwell, Plants of New Zealand, p. 233, 234.)

Cryptostegia grandiflora R. Brown. (Asclepiadaceae.) 44786. Seeds of **Palay rubber** from Old Fort, New Providence, Bahamas. Presented by Mr. W. F. Doty, American Consul, Nassau, Bahamas, who secured them from Dr. Charles S. Dolley. A twining shrub, native of India, but cultivated in many places in the tropics for the rubber obtained from the sap. It has opposite, elliptic leaves; and terminal cymes of large reddish purple flowers which bloom all the year. The leaves and stems contain an abundance of latex which yields a quantity of rubber estimated at 2 per cent of the weight of the fresh plant. From the bast fiber of the inner bark a good quality of wrapping paper has been made. The seed coma furnishes a silky floss which can be made into an excellent felt. Propagation is by seeds. (Adapted from C. S. Dolley, On the Occurrence of Palay Rubber in Mexico, India-rubber Journal, May 20, 1911.)

Gladiolus alatus L. (Iridaceae.) 44722. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. A South African gladiolus with an upright stem, 6 to 8 inches in height, and 3 to 4 leathery, linear or sword-shaped, stiff leaves, the outermost being twice as long as the others. The 5 to 10 reddish yellow flowers, which are very divergent, have an odor like that of sweetbriar. (Adapted from Curtis's Botanical Magazine, vol. 15, plate 586.)

Gladiolus angustus L. (Iridaceae.) 44723. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. A plant with an ascending stem up to 2 feet in height,

and narrow, upright leaves with prominent midrib. The white, scentless flowers, which grow in a lax, one-sided spike, are narrow, straight, and funnel-shaped. It is a native of the Cape of Good Hope. (Adapted from Curtis's Botanical Magazine, vol. 17, plate 602.)

Gladiolus blandus Solander. (Iridaceae.) 44724. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. A South African plant with sword-shaped leaves somewhat shorter than the stem which is from 6 inches to 2 feet in height, and bears 3 to 10 white or reddish-tinged scentless flowers. There are many horticultural varieties which are very ornamental, and are easily propagated from seeds and offsets. (Adapted from Curtis's Botanical Magazine, vol. 17, plate 625.)

Gladiolus cuspidatus Jacquin. (Iridaceae.) 44725. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. An erect, bulbous plant, 2 to 3 feet high, with sword-shaped leaves usually shorter than the stem; and 4 to 8 white or pinkish flowers in a lax one-sided spike. It is a native of the Cape of Good Hope where it flowers in May and June. (Adapted from Curtis's Botanical Magazine, vol. 15, plate 582.)

Gladiolus recurvus L. (Iridaceae.) 44726. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. An ornamental plant, 1 to 3 feet tall, with 3 linear leaves having prominent midribs. The 2 to 5 yellowish purple flowers have a strong violet odor, and are produced in a lax spike, in April. It is a native of the Cape of Good Hope. (Adapted from Curtis's Botanical Magazine, vol. 15, plate 578.)

Gladiolus tristis L. (Iridaceae.) 44727. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Avondbloem.**" A South African plant with 2 or 3 linear leaves which are 4-winged toward the top due to the comparative size of the midrib, which equals the blades in width. The one-ranked yellowish flowers, sometimes lightly streaked with purple, give off a very strong fragrance at night, but are practically scentless during the day. (Adapted from Curtis's Botanical Magazine, vol. 27, plate 1098.)

Do not forget that a one hundred dollar Liberty Bond will clothe a soldier.

Gladiolus undulatus Jacquin. (Iridaceae.) 44728. **Gladiolus** seeds from Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Agricultural Supply Association. A bulbous plant, with a stem a foot in height including the spike, and several sword-shaped leaves about a foot long. The 4 to 6 flowers are milk-white, marked with red, and are produced in a very lax spike. It is a native of South Africa. (Adapted from W. T. Thiselton-Dyer, Flora Capensis, vol. 6, p. 155.)

Jasminum multipartitum Hochstetter. (Oleaceae.) 44740. Seeds from Cape Town, South Africa. Presented by Mr. L. Peringuey, Director, South African Museum. A climbing, much-branched, ornamental shrub up to 10 feet in height, with opposite, glabrous, ovate to lanceolate leaves nearly 3 inches in length; and solitary, terminal or axillary, fragrant white flowers about an inch and a half long. It is a native of Natal, South Africa. (Adapted from J. Medley Wood, Natal Plants, vol. 4, pl. 328.)

Lactuca sativa L. (Cichoriaceae.) 44729-44730. **Lettuce** seeds grown by Mr. George W. Oliver, of the Bureau of Plant Industry, Washington, D. C., from two forms selected by Dr. B. T. Galloway several years ago. "They have very large heads, under good conditions in a cool house. The head is from 8 to 10 inches in diameter. Everyone who has sampled them says that they are by far the best forcing lettuces. They are strictly hothouse lettuces, identical in growth but No. 44729 has white seeds and 44730 has black seeds." (Oliver.)

Malus sylvestris Miller. (Malaceae.) 44713. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farm, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Anson.** A seedling of **Winter St. Lawrence** of medium size with a pale yellow, almost white skin and white, juicy, subacid flesh, resembling **Fameuse.** Season October to December, coming just before **Mc Intosh.** (See the Reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experiment Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44714. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farm, for

trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Battle.** A seedling of **Wealthy** of large size with yellowish, red-splashed skin and pinkish, juicy flesh resembling a raspberry in flavor. Season late August to early September, coming just before **Dutchess**. Should make an excellent cooking apple and is good for dessert. (See reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44715. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farms, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Drumbo.** A **Winter St. Lawrence** seedling of large size with pale yellow, crimson-splashed skin and rather coarse, juicy, white flesh. Flavor subacid; resembles **Winter St. Lawrence,** but is a better keeper. (See reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44716. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farms, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Galetta.** A **Winter St. Lawrence** seedling above medium size; color yellow with a red cheek; flesh white, tender and juicy. A good eating apple, resembling **Wealthy** in outward appearance. (See the Reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44717. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farms, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Jethro.** A seedling of **Wealthy** of medium size, having yellow, red, orange and carmine-splashed skin, and yellowish, subacid, juicy flesh. (See Reports of the Horticulturist Experimental

Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44718. **Apple scions** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farm, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Luke.** A large-sized **Wealthy** seedling with pale greenish-yellow skin and a red cheek, and yellowish, coarse, juicy flesh. Season October and November to late December. (See Reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44719. **Apple cuttings** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farm, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Melvin.** A medium-sized **Wealthy** seedling with pale yellow red-splashed skin and reddish-yellow, tender, melting, flesh of good spicy flavor. Season middle to end of August. Considerably like **Sops of Wine** in outward appearance and quality. (See Reports of the Horticulturist, Experimental Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Malus sylvestris Miller. (Malaceae.) 44720. **Apple cuttings** from Ottawa, Canada. Presented by Mr. W. T. Macoun, Dominion Horticulturist, Central Experiment Farm, for trial at the Northern Great Plains Experiment Station, Mandan, North Dakota. **Rupert.** A large-sized seedling of **Russian** with pale greenish-yellow, pink-tinged skin and white, tender, juicy flesh. Quality good; season early August. Earlier than **Tetofsky** and better than **Yellow Transparent.** (See Reports of the Horticulturist, Experiment Farms, Ottawa, Canada, 1906-1915, in which will be found a full account of the development of the remarkable collection of seedlings at the Experimental Farms, Ottawa.)

Remember that a one hundred dollar Liberty Bond will provide five rifles.

Nannorhops ritchieana (Griff.) Wendland. (Phoenicaceae.) 44773. Seeds of **Mazri palm** from Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanical Gardens. A low, gregarious shrub, usually stemless, but sometimes with a stem 10 to 20 feet in length. The leaves, which are 2 to 4 feet long, and of a grayish green color, are beaten with mallets to remove the fiber which is used in making mats, baskets, etc. The fruit is a nearly round, 1-seeded drupe. The reddish brown wool of the petioles is impregnated with saltpeter and used as a tinder for match-locks. This palm is a native of Baluchistan and Mekran, where it ascends to 5500 feet. In Europe it grows best in a well drained sandy loam, and is propagated by seeds and offsets. (Adapted from E. Blatter, Journal Bombay Natural History Society, vol. 21, p. 72–76.)

Olea europaea L. (Oleaceae.) 44709. **Olive plant** from Cairo, Egypt. Presented by Mr. Thomas W. Brown, Director, Horticultural Division, Giza Branch, Ministry of Agriculture. **Tafahi.** Though reputed as only moderately productive the large size and fine appearance of the **Tafahi,** or apple olive, cause it to be in great demand throughout the Egyptian delta. As the flesh is very soft and buttery when fully ripe it is marketed about November 1st, when first beginning to color. At present no oil is manufactured from the Fayum olives, but in one of the villages stones of ancient oil mills were seen of beautiful red Assuan granite, and no doubt of Roman origin. Their purpose was unknown to the present inhabitants. From this it may be conjectured that the present olive trees of Fayum, as well as those of Dakhla Oasis, have come down from the time of the Roman occupation during the first century A. D." (S. C. Mason.)

Pandanus rockii Martelli. (Pandanaceae.) 44780. Plants of **screw-pine** from Honolulu, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. A slender, erect tree, 8 to 10 m. (26 to 33 feet) in height, with bright green leaves; and large, wedge-shaped fruits, 8 cm. (3 inches) long and 6 cm. (2 2/5 inches) broad at the apex. It was originally collected on Helei Islet, Palmyra Island, in July, 1913. (Adapted from Bulletin No. 4, College of Hawaii Publications, p. 42, 1916.)

Remember a fifty dollar Liberty Bond would protect 1,000 soldiers from death by small pox.

Do not forget that a fifty dollar Liberty Bond would provide trench knives for a rifle company.

Phaseolus lunatus L. (Fabaceae.) 44758. Seed of a **lima bean** from Paraguana, Venezuela. Presented by Mr. H. M. Curran. "**Tapirama chicoa.** Small, gray bean, with a yellow eye. An unusual marking for this species." (D. N. Shoemaker.)

Phaseolus lunatus L. (Fabaceae.) 44759. Seeds of a **lima bean** from Miraca, Paraguana, Venezuela. Presented by Mr. H. M. Curran. "Small, white bean, very similar to beans received from Ceylon, Burma, and Java." (D. N. Shoemaker.)

Phaseolus lunatus L. (Fabaceae.) 44760. "**Tapirama colorado.** Small, red bean, not like any variety of **lima** in the American trade." (D. N. Shoemaker.)

Phaseolus lunatus L. (Fabaceae.) 44761. Seeds of a **lima bean** from Miraca, Paraguana, Venezuela. Presented by Mr. H. M. Curran. "**Tapirama amarilla.** Small, yellow bean; an unusual color for this species." (D. N. Shoemaker.)

Pistacia chinensis Bunge. (Anacardiaceae.) 44768. Seeds of a *Chinese Pistache* from China. Obtained by Mr. Edwin S. Cunningham, American Consul, Hankow, through Mr. Nelson T. Johnson, American Consul, Changsha. This beautiful Chinese tree with graceful pinnate leaves which are at first dark red, then glossy green, and finally, in autumn, become scarlet, purple, and yellow has done so well in many parts of the country that we can now heartily recommend it for park and avenue planting where the winters are not too severe. It has withstood temperatures of 4° Fahr. without injury, but has succumed to the more severe winters here in Washington. It is essentially a dry climate tree and has done particularly well in the South West.

Raphanus sativus L. (Brassicaceae.) 44731. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Bottle.** A large, bottle-shaped radish, called **Tokuri** in Japan. (Adapted from Useful Plants of Japan, p. 21, 1895.)

Raphanus sativus L. (Brassicaceae.) 44732. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. A radish with a root over 3 feet long and only 2 or 3 inches in circumference. Very suitable for pickling. (Adapted from Catalogue of the Yokohama Nursery Co., 1916–1917, p. 77.)

Raphanus sativus L. (Brassicaceae.) 44733. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Nerima Long (Mikado).** A variety of radish with long, large cylindrical roots.

Raphanus sativus L. (Brassicaceae.) 44734. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **All Season.** "Called **Tokishiraza** in Japan. It is a very large, long, deep-rooted snow-white radish, which does not extend above the soil; it is always tender and crisp and has a delicious flavor." (Aggeler & Musser Seed Co., Catalogue 1917, p. 56.)

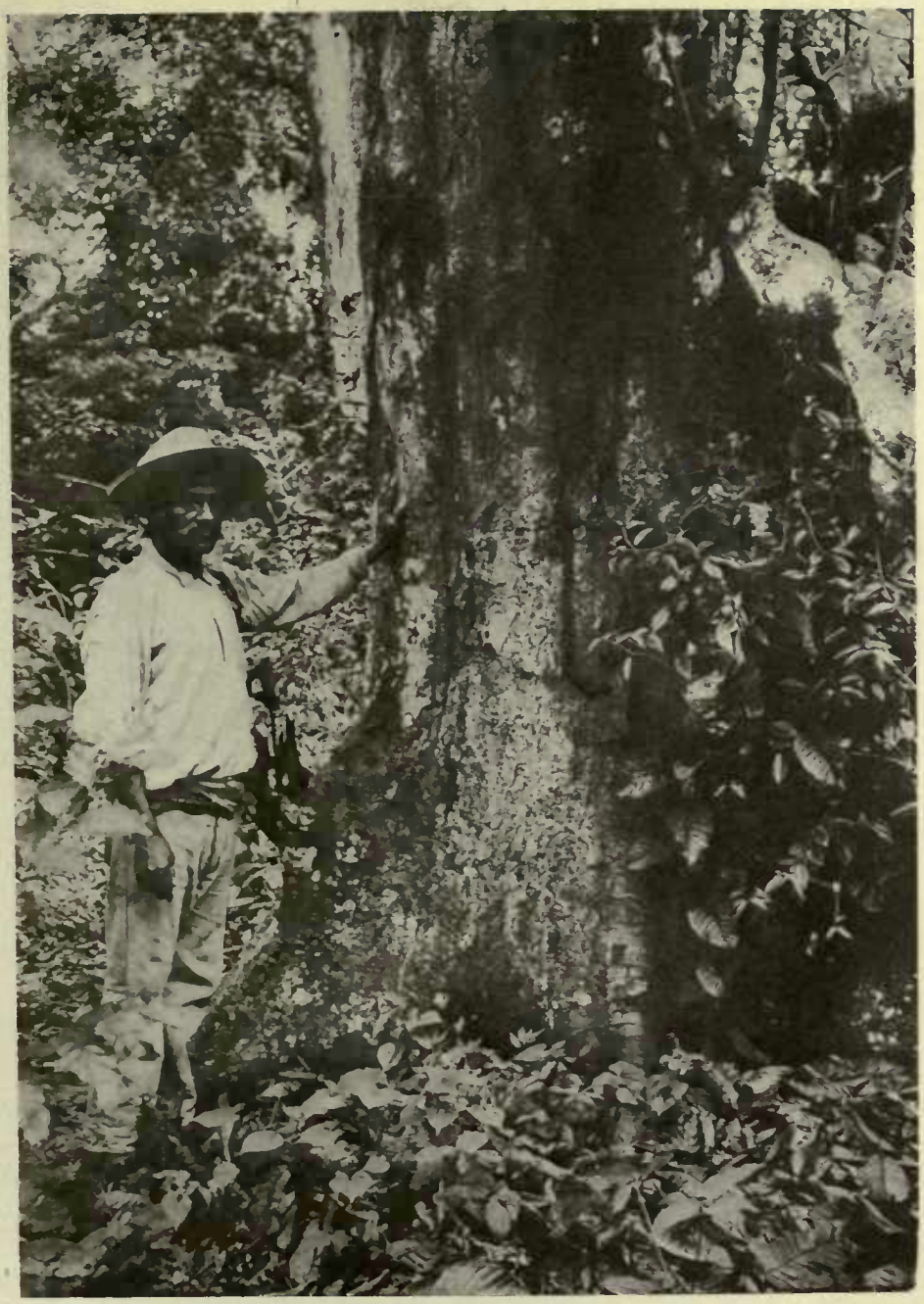
Raphanus sativus L. (Brassicaceae.) 44735. **Radish** seeds from Yokohama, Japan. Purchased from the Yokahama Nursery Company. **Miyashige.** A variety found chiefly in Miyashige, province of Owari, Japan, with a conical root about 1½ feet in length and 3½ inches in diameter. It is very sweet and should be boiled, dried, or pickled. (Adapted from Useful Plants of Japan, p. 21.)

Raphanus sativus L. (Brassicaceae.) 44736. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Ninengo.** A variety with white, thin, hard roots. It is a biennial, and the seeds are sown at the end of spring. (Adapted from Useful Plants of Japan, p. 22.)

Raphanus sativus L. (Brassicaceae.) 44738. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Sakurajima Mammoth.** The largest variety of radish known, cultivated chiefly at Sakurajima, Osumi, Japan. It is nearly globular, about 3 feet in circumference in the largest forms, and weighs 20 to 30 pounds. It is eaten raw, boiled, dried or preserved in salt; and has a sweet wholesome taste. (Adapted from Useful Plants of Japan, p. 20.)

Raphanus sativus L. (Brassicaceae.) 44739. **Radish** seeds from Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Shogoin.** A variety obtained from seed of variety **Horio** sown in Shogoin, province of Yamashiro, Japan. It is about a foot long, 6 to 7 inches in circumference, and has an excellent flavor. (Adapted from Useful Plants of Japan, p. 22.)

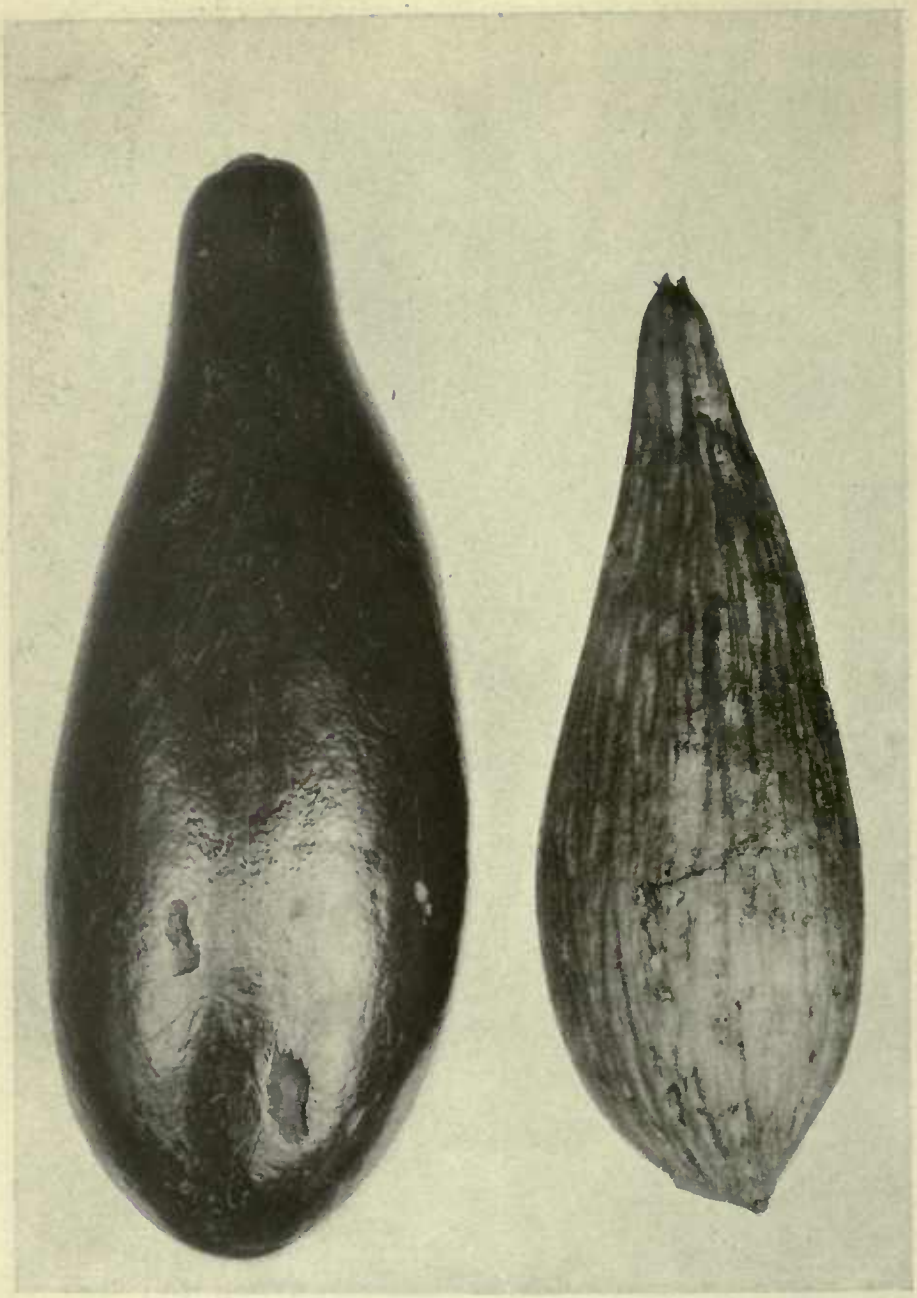
Remember that a fifty dollar Liberty Bond will buy 10 cases of surgical instruments for officers' belts.



THE ANAY, A WILD RELATIVE OF THE AVOCADO.

(PERSEA SP., S. P. I. NO. 43433.)

An as yet undescribed species of Persea which is closely related to the cultivated avocado, occurring as a wild forest tree at an altitude of 1,200 feet in the rainy forest region of Guatemala. It is a tall, slender tree, attaining 70 to 80 feet in height, and is left as a shade tree in coffee plantations. Unlike the Mexican avocado, its leaves are not anise scented. It flowers in May, and its fruits ripen in August and September. In the development of the avocado industry this species may prove valuable for stock purposes in regions of heavy rainfall. (Photographed by Wilson Popenoe at Mazatenango, Guatemala, September 23, 1916; P16797FS.)



A FRUIT AND SEED OF THE ANAY.

(*PERSEA SP., S. P. I. NO. 43432.*)

A wild relative of the avocado, with smooth, glossy black fruits, 4 to 6 inches long, having a very thin, membranous skin which adheres closely to the firm, oily flesh. The latter has a rich, bland flavor like that of a good avocado, but with a suggestion of sweetness. If the flesh of the anay was more abundant, its flavor would make it of great value. The fruits do not ripen on the tree, but fall to the ground while still hard and require two or three days to soften. This may prove of value for breeding purposes. (Photographed by Wilson Popenoe at Mazatenango, Guatemala, September 23, 1916; P16806FS.) Natural size.

Solanum sp. (Solanaceae.) 44800. Seeds from Venezuela. Presented by Mr. Henry Pittier. "An herbaceous, trailing plant, bearing edible fruits; desirable for cultivation in cool, shady places in a mild climate." (Pittier.)

Ziziphus mucronata Willdenow. (Rhamnaceae.) 44748. Seeds from Kartoum North, Sudan, Africa. Presented by the Principal, Central Research Farm, Education Department, Sudan Government. A tree, 15 to 30 feet tall, with alternate, crenate or serrate leaves, up to 3 inches long; spine-like stipules; and small, greenish flowers in axillary cymes, up to an inch in length. The numerous dark red, globose fruits, about one-half inch in diameter, are edible, and are believed to be the lotus mentioned by Mungo Park as being used for making into bread, which tastes like gingerbread. A paste made of the leaves, and a decoction of the root are used medicinally; the wood is tough and is used for yoke-keys; and the seeds are used for making rosaries. It is a native of tropical and southern Africa. Arabic name **Siddir** or **nabbak.** (Adapted from T. R. Sim, Forest Flora of Cape Colony p. 177, 178, and from Kew Bulletin Miscellaneous Information, Additional Series 9, Part 1, p. 162, 1908.)

Notes from Correspondents abroad.

Mr. Wilson Popenoe writes from Guatemala City, Guatemala, November 6, 1917:

"I am forwarding this week, via the pouch, my number 195, being 100 scions and budsticks of avocado No. 32, from the property of Eulogia Duarte, near Amatitlan, and my number 196, cuttings of *Malpighia sp.* the "azerola" from Amatitlan.

"This avocado, No. 32, (named **Akbal**) is a variety which I have had under observation for several months, and which I have been counting upon to complete my set. It is a very early variety. Previous to obtaining this number the set has included no very early forms, the best probably being No. 6, from Antigua, which is two to three months earlier than the majority of varieties in that region. No. 32 appears to be an aberrant type which ripens at Amatitlan in September, while the majority of varieties in the same region do not ripen until January or February. I have found

Remember that a fifty dollar Liberty Bond will buy 37 cases of surgical instruments for enlisted men's belts.

several other trees which seem, like 32, to bloom and ripen entirely out of the main season, but 32 is the only one whose fruit is up to standard. This variety is of excellent quality. The fruit is long and slender, which may be a slight defect from our point of view, but so far as I can see this is the only defect that it has, and if it ripens as far out of the main season in California and Florida as it does here, it will be so valuable that the slender form will not matter. It remains to be seen whether or not the variety will retain its habit of flowering out of season in California and Florida.

"Replying to your letter of the 18th ult., re papaya seed, it seems to me that there are much better regions than Guatemala in which to obtain this. The papaya is not very abundant here, and there are very few superior varieties. To obtain large quantities of seed of the latter, such as you desire, would be a very slow job, and I do not believe more than two or three pounds could be obtained within the next month. I believe it would be much more satisfactory to obtain seed from Hawaii, where better varieties are available in abundance.

"I will try to get specimens of chayote roots and the soil around them, so that Dr. Cobb can make an examination. I expect to go to Antigua this week, and while in that region will see if I can get any more information re chayote culture. In the Indian villages around Antigua there are a great many chayotes grown.

"I expect to ship 4000 avocado seeds within a couple of weeks, but they will probably not reach you until a week later than this letter."

INVENTORY OF SEEDS AND PLANTS IMPORTED.

Owing to the war demands upon the government printing funds, it has been necessary to suspend temporarily the publication of the inventories of seeds and plants, which under normal conditions should appear every three months. There are now prepared sevveral of these inventories, which have been ready for the printer for many months.

While it is out of the question to publish these inventories in Plant Immigrants, it does seem advisable to reproduce here the brief Introductory Statements

Do not forget that a fifty dollar Liberty Bond will render painless four hundred operations.

to these inventories, which direct attention to the more important introductions. One of these statements will appear in each of Plant Immigrants.

Inventory No. 45. Covering the period from October 1st to December 31st, 1914.

Although this inventory chronicles the arrival of only 370 new plant immigrants, it describes some that are of unusual interest and deserving of special mention. It covers certain plants of the high Peruvian Andes collected by Mr. O. F. Cook while attached to the Yale University-National Geographic Society Expedition. These include a remarkable wild relative of the tomato (No. 41318), which has a pleasant, slightly acid flavor, resembling that of an apple, and remarkable keeping qualities which may make it of particular interest to tomato breeders; one of the Mutisias (No. 41317), a large trailing composite vine worthy of trial in our greenhouses for its beautiful orange to scarlet pendent flowers which suggest thistles; a passion fruit (No. 41316), the pulp of which separates from the hard shell, making it possible to peel the shell away; the tara (*Caesalpinia pectinata*, No. 41323), a spiny leguminous tree or shrub which may make a striking hedge plant in our Southwestern States, its bright scarlet pods contrasting with its deep, polished-green leaves as holly berries do; the tasta (No. 41324), a fine-leaved shrubby *Escallonia*, which may make a desirable hedge plant as far north as San Francisco; the lengli (*Hesperomeles oblonga*, No. 41325), an attractive tree with evergreen leaves and brilliant red fruits, hanging on all winter like holly berries; the capuli cherry of Peru (*Prunus salicifolia*, No. 41328), from an altitude of 12,000 feet, which resembles a chokeberry but has a firm flesh of good texture and agreeable taste; a variety of the sweet cassava (*Manihot dulcis*, No. 41320), which species, according to Cook, is represented by varieties maturing at 6,000 feet on the eastern slopes of the Andes and in the cold cloudy coastal climate of the Pacific coast; a species of tree (*Datura sanguinea*, No. 41329), with green, orange, and scarlet flowers, which occurs where frosts are encountered every night; the lucuma of Peru (No. 41332), a popular fruit with rich mealy flesh, resembling a cooked sweet potato and with a hardiness which

Do not forget that a fifty dollar Liberty Bond will buy fourteen rifle grenades.

presumably will enable it to be grown in California and Florida; a South American black walnut (*Juglans sp.*, No. 41334), of distinct value of plant breeders, the bark of which is used for dyeing wood the color of the famous vicuna ponchos; and a remarkable species of the papaya (No. 41339), which produces fruits that will keep for two weeks or more after they are ripe and which are as deliciously fragrant as a well-ripened muskmelon and of excellent flavor but tough texture. Although the quinoa (*Chenopodium quinoa*, No. 41340), has often been introduced into America and has nowhere yet found a home, it is important to get an opinion regarding this plant from a keen observer and thoroughly trained agricultural explorer. Mr. Cook reports that previous to the introduction of wheat and barley this cultivated pigweed was one of the two most widely grown crops of the remarkable Inca civilization, that it is pronounced by a Scotchman resident there to-day as being better than oatmeal for a breakfast food, and that it appears very vigorous and productive and may possibly be gathered and thrashed by machinery.

Among the introductions sent in by correspondents or collected by travelers, there are several unusual things covered by this inventory. To Rev. George Campbell, the American missionary who has sent in so many interesting plants from South China, we are indebted for a most remarkable dwarf peach (No. 41395), which is handled as a pot-grown tree in China and which he says comes true to seed. He reports that one small tree 15 inches high with a stem no larger than a lead pencil ripened five good-sized edible clingstone peaches. The behavior out of doors at Chico of a number of seedlings of this peach suggests the possibility of a dwarf race of peach trees of value as fruit producers and for plant breeding. Mr. Carlos Wercklé, of Costa Rica, sends seeds of the sansapote (*Licania platypus*, No. 41393), the most beautiful forest tree in Costa Rica, which grows to gigantic size, bears an edible fruit, and produces timber nearly as good as the Cedrela timber of Cuba. Mr. A. Rolloff, director of the Tiflis Botanic Garden, who has sent so many new hardy plants from the Caucasus, presents us with seeds of the beautiful sulphur-yellow peony (No. 41476, recently discovered near Lagodekhi in eastern Central Caucasus by Mlokosewitsch, for

Remember that a fifty dollar Liberty Bond will buy twenty-three hand grenades.

whom it was named. *Caragana arborescens* has become almost a necessary hedge and shelter-belt plant on the Canadian Great Plains, and it is coming to a better appreciated in our own Northwest. A beautiful, striking, prostrate form (No. 41480) to which Mr. Norman M. Ross, of Indian Head, directed attention last year, and which he has since sent us, can scarcely fail to be of value for dooryard planting in the coldest portions of our country.

It always gives a feeling of satisfaction to realize that a tree introduction has reached a stage where it is producing a supply of seed in this country. The Queensland nuts (No. 41472) sent in from Homestead, Fla., by Mrs. L. L. Bow were produced by a tree sent to her by this office in 1911. Its productiveness and the quality of the nuts indicate that this new nut tree, which furnishes a basis for a small industry in Australia, is a promising one for Florida at least.

Collections of seven winter-wheat varieties (Nos. 41510 to 41516) from Baluchistan, presented by Mr. A. Howard of the Indian Service, and of eighteen varieties (Nos. 41342 to 41356 and 41682 to 41684) from Pusa, India, should yield something valuable for the wheat breeders.

The hybrids between the American chinkapin and the Japanese chestnut (Nos. 41357 to 41360), made by Dr. Walter Van Fleet, bear nuts which in size and sweetness should recommend them to the serious attention of nut growers.

The Mascarene grass (*Osterdamia tenuifolia*, No. 41509.) which has been used so extensively by the Japanese for lawns, but which comes from the island of Guam, has already shown its remarkable lawn-making character in southern Florida, where lawns are most difficult to maintain.

A species of *Rubus* (No. 41676) from Darjiling, making a growth of 20 feet and said to be the most robust of the genus, together with five other species from the same section of the Himalayas, may have special interest for breeders, even though they may not do well generally.

Those Americans who have tried in vain to grow as a border plant the brilliant *Calceolaria* so common in Great Britain may be glad to test as a substitute the

To dress those trench wounds which can be cared for with 'First Aid Packets', a fifty dollar Liberty Bond would take care of 160 injuries.

Australian *Crotalaria* (No. 41571), which Mr. James Pink, who sends it in, predicts will be highly successful in borders in dry situations.

The Pondoland cocos (*Jubaeopsis caffra*, No. 41484) will have a botanical interest to all palm lovers as the only member of the tribe to which the coconut belongs, which occurs in Africa,- all the others being inhabitants of the Western Hemisphere.

David Fairchild,
Agricultural Explorer in Charge.

OBITUARY.

Stephen Conrad Stuntz.

It is with the deepest regret that we announce the death from pneumonia, on the third of February, 1918, of Mr. Stephen Conrad Stuntz, who has had charge of all the publications of this office for the last eight years. Mr. Stuntz devoted much time and energy to the building up of Plant Immigrants and its originality and many of its characteristics will remain as a concrete evidence of his industry, intelligence, and botanical ability.

Remember that a fifty dollar Liberty Bond will supply a bandage long enough to go from the Capitol to the White House and back again (nearly two miles) or it will bandage 555 hands.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, R. N. Jones, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.
Henry Y. Gouldman, Laboratory Aid.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Harry Duffield, Jr., Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Aaron Aaronsohn, Haifa, Palestine; Thomas W. Brown, Cairo, Egypt; H. M. Curran, Laurel, Md.; M. J. Dorsey, University Farm, St. Paul, Minn.; Robt. H. Forbes, Tucson, Ariz.; Gustav Eisen, New York City; E. C. Green, Natal, Estado do Rio Grande do Norte, Brazil; A. C. Hartless, Seharanpur, India; Barbour Lathrop, Chicago, Ill.; C. C. Logan, Luray, Va.; H. Nehrling, Gotha, Fla.; Miss Eliza R. Scidmore, Washington, D. C.; Charles Simpson, Littleriver, Fla.; H. P. Stuckey, Experiment, Ga.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; H. N. Whitford, School of Forestry, New Haven, Conn.; E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

RECEIVED
JUN 13 1918
Division of Forestry
University of California

PLANT IMMIGRANTS.

No. 134. JUNE, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1179	Mesembryanthemum	1184
Annona	1179	Nageia	1184
Artocarpus	1180	Otophora	1185
Boehmeria	1180	Passiflora	1185
Brassica	1180	Persea	1185
Caesalpinia	1180	Polygonum	1186
Canavali	1181	Prunus	1186
Casuarina	1181	Ruprechtia	1187
Citrullus	1181	Saraca	1188
Coix	1182	Strophanthus	1188
Cynometra	1182	Telopea	1188
Dahlia	1182	Trifolium	1188
Guaiacum	1183	Vittadinia	1189
Hydnocarpus	1183	Voandzeia	1189
Leptospermum	1183	Zea	1189
Maximilianea	1184		

Plates:

Pl. 219. The Pacaya Palm of Guatemala, *Chamaedorea sp.*
220. The Large-fruited Hawthorn of Gautemala, *Crataegus stipulosa.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

June 1, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia albida Delile. (Mimosaceae.) 44922. Seeds from the vicinity of Khartum, Egyptian Sudan. Presented by Mr. F. G. Walsingham, Giza Branch, Ministry of Agriculture, Cairo, Egypt. A large, much-branched tree, native of tropical and northern Africa, and yielding a gum similar to gum arabic. The leaves are eaten by goats, and the bark is used in curing leather. (Adapted from Oliver, Flora of Tropical Africa, vol. 2, p. 339, 1871, and from Kew Bulletin Miscellaneous Information, Additional Series 9, Part 2, p. 288.)

Acacia seyal Delile (Mimosaceae.) 44923. Seeds from the vicinity of Khartum, Egyptian Sudan. Presented by Mr. F. G. Walsingham, Giza Branch, Ministry of Agriculture, Cairo, Egypt. A small or medium-sized tree common in tropical Africa north of the equator. It is one of the principal gum-yielding acacias in the Nile region. The gum, which flows freely from all wounds, is of a bright amber color, becoming white and brittle when thoroughly dry. It has a relatively high viscosity and strong adhesive power. (Adapted from Oliver, Flora of Tropical Africa, vol. 2, p. 351, and from Kew Bulletin Miscellaneous Information, Additional Series 9, Part 2, p. 295-296.)

Acacia spadicigera Cham. & Schlecht. (Mimosaceae.) **Bull-horn acacia.** 44914. Seeds from Zacuapam, Vera Cruz, Mexico. Presented by Dr. C. A. Purpus. "An interesting shrub or small tree, with spreading branches armed with thorns resembling the horns of a bull, and consequently called, together with its allies, **bull-horn acacia.** The thorns attracted the attention of early botanists from the fact that they are usually hollowed out and inhabited by stinging ants which serve as body-guards, protecting the plant from herbivorous animals. The present species is very closely allied to *A. cornigera* of Linnaeus if not identical with that species. The hollow, indehiscent pods, terminating in sharp spines, enclose a number of hard seeds surrounded by a sugary aril which is much relished by cattle and other animals." (W. E. Safford.)

Annona cherimola Miller. (Annonaceae.) 44841. **Cherimoya.** From Oran, Salta, Argentina. Presented by Mr. S. W. Damon. "Seeds of *Annona cherimola* from rather good fruit which I ate a few days ago. The trees which bore the fruit withstood, last winter, a temperature of about 15° Fahr." (Damon.)

Artocarpus communis Forster. (Moraceae.) 44908. **Breadfruit.** From Honolulu, Hawaii. Presented by Mr. Gerrit P. Wilder. "**Ulu** (Hawaiian variety)." This variety, which now grows wild throughout the Hawaiian Islands, was originally introduced from Tahiti. It has large, rough, ovate, deeply lobed leaves, and the staminate flowers appear in large yellow catkins. The large-stemmed fruit is either round or oblong and varies from 5 to 8 inches in diameter. The thick, tough rind, which is brownish at maturity, encloses a firm, very starchy and somewhat fibrous pulp which becomes mealy when cooked, slightly resembling a dry sweet potato. It is much esteemed as an article of diet. The tree is propagated by suckers or by layering. (Adapted from G. P. Wilder, Fruits of the Hawaiian Islands, p. 100, plate 48, under *A. incisa.*)

Boehmeria macrophylla D. Don. (Urticaceae.) 44860. Seeds from Nice, France. Presented by Dr. A. Robertson-Proschowsky. A pretty shrub with narrow, dentate leaves 6 to 12 inches in length, and very long, drooping flower spikes. It is a native of Upper Burma and northeastern India, where it ascends to 4000 feet. The wood is light reddish brown and moderately hard, and the bark yields a good fiber which is used for ropes and fishing lines. (Adapted from J. S. Gamble, Manual of Indian Timbers, p. 658, 1902.)

Brassica pekinensis (Lour.) Skeels. (Brassicaceae.) 44892. **Pe-tsai.** From Ann Arbor, Michigan. Purchased from Mrs. Fred Osborn, Manager, Varsity City Celery Company. "**Lun gar bak.** Of the dozens of strains of Chinese cabbage, the short-leaved, solid-headed strain is the one that we have always used and found most profitable. As a field crop sow in rows 3 feet apart and thin to 18 inches in the row. Keep the plants well watered and cultivated, for as soon as growth is checked the seed head is formed and bursts forth as soon as moisture is again applied." (Osborn.)

Caesalpinia melanocarpa Grisebach. (Caesalpiniaceae.) 44816. **Guayacan.** From Chaco Paraguayo, near Asunción, Paraguay. Presented by Mr. C. F. Mead, Asunción. "A very handsome and useful timber tree, though for the most part useless in Chaco through being unsound. In many respects it corresponds to teak. The bark has medicinal properties. It may do well in the southern United States." (Mead.)

Canavali gladiatum (Jacq.) DeCandolle. (Fabaceae.) 44806. **Sword bean.** From Cairo, Egypt. Presented by Mr. F. G. Walsingham, Giza Branch, Horticultural Division, Ministry of Agriculture. A perennial, climbing plant, with leaves composed of 3 roundish leaflets 2 to 6 inches long, and axillary racemes of dark purple flowers. The scimitar-shaped pods are about a foot long and contain numerous red or white seeds which resemble large beans. The young pods are sliced and boiled for table use, and are also pickled. Propagation is by seeds.

Casuarina stricta Dryander. (Casuarinaceae.) 44909. **Drooping sheoak.** Presented by Mr. B. Harrison, through Mr. C. V. Piper. An Australian tree, 20 to 30 feet in height, known in New South Wales as **Feld's Fodder tree;** suitable for dry or semi-arid sections. The foliage is eagerly eaten by cattle, especially in times of drought, and it is said that one tree has supported 8 to 10 head of stock at one time. Even in large quantities it does not appear to have an injurious effect on the cattle. The wood is used for cabinet work and shingles, and makes an excellent fuel. (Adapted from letter of Mr. B. Harrison of May 8, 1917.)

Citrullus vulgaris Schrader. (Cucurbitaceae.) 44842. **Water-melon** seeds from Durban, Natal. Presented by Mr. William W. Masterson, American Consul. **Mankataan.** A melon much cultivated throughout Natal for use as cattle feed. It is exceptionally tough, enduring rough handling and keeping for six months after ripening without spoiling; but, at the same time, as it is very watery, it makes an excellent green fodder for live stock, especially when mixed with such feed as alfalfa hay or corn stalks. It is also very suitable for jam making, some of the Cape Colony firms using large quantities for this purpose. One pound of seed will plant two or three acres, and as much as 120 tons of melons have been taken from a single acre. It might be suitable for the semiarid regions of the United States. (Adapted from William W. Masterson, Consular report, April 18, 1917.)

Citrullus vulgaris Schrader. (Cucurbitaceae.) 44869. **Water-melon** seeds from Curacao, Dutch West Indies. Collected by Mr. H. M. Curran. "The watermelons of Curacao are the best I have tasted in the tropics. March, 1917." (Curran.)

Coix lacryma-jobi ma-yuen (Rom.) Stapf. (Poaceae.) 44843. **Job's tears.** From Chosen, Korea. Presented by Miss Katherine Wambold, Yun Mot Kol, Keijo, through Mrs. M. W. Spaulding, Washington, D. C. "**Yule moo.** Grows in ordinary fields. Made into meal by mixing with water, then draining, drying, and pounding. When mixed with water and salt it is made into a kind of bread." (Wambold.) This variety might be called the cultivated edible Job's tears and includes many forms, all of which are characterized by having a thin, loose, easily broken shell. They are often longitudinally striated and in many examples are constricted at the base into what has been called an annulus. Among the aboriginal tribes in the central provinces of India this grain forms an important article of food. In Japan, where the plant has been introduced, the seeds are pounded in a mortar and eaten as meal. (Adapted from the Agricultural Ledger, No. 13, p. 217-225, 1904.)

Cynometra cauliflora L. (Caesalpiniaceae.) 44895. **Nam-nam.** From Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. A medium-sized tree, with a very irregular, knotty trunk, covered with thick, brown bark marked with numerous grayish and whitish spots. The alternate, compound leaves are smooth and light green when mature, but when young are red or pink, or, in some varieties, yellow. From the trunk and branches appear the corymbs of small, pink or white flowers. The flattened, roundish, light brown pods have a fleshy portion which is very palatable when stewed. The tree is a native of Java. (Adapted from Van Nooten, Fleurs & Fruits de Java, part 6, 1863.)

Dahlia imperialis Roezl. (Asteraceae.) 44819. **Tree dahlia.** From Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 105. From Purula, Department of Baja Verapaz.) A double variety of the common tree dahlia. It is pale lilac, the same color as the typical form; but unlike the latter, which has large single flowers, this variety has double flowers resembling in form some of the common garden dahlias of the North. The plant grows to a height of 15 feet or even more, and blooms during a long period. It is cultivated in the gardens of the Indians, but is not common. In the Pokom dialect it is called **shikhor,** in Quekchi **tzoloh.**" (Popenoe.)

Guaiacum officinale L. (Zygophyllaceae.) 44858. **Guayacan** seeds from Zacapa, Guatemala. Collected by Dr. F. S. Johnson, and sent through Mr. Wilson Popenoe, of this Bureau. "(No. 145a. June 5, 1917.) The **gauyacan** sometimes called by Americans **lignum vitae,** is found in abundance upon the plains of the lower Motagua valley, in the vicinity of El Rancho, Zacapa, and other towns. It is a small tree sometimes attaining a height of 30 feet, and usually somewhat spreading in habit. The trunk is gnarled and twisted, with slender branches bearing small and delicate leaves. Toward the end of the dry season, i.e., in February or March, the tree comes into flower, and is then a mass of Lavender purple, distinguishable for long distances across the plains. It remains in bloom for several weeks. The wood is exceedingly hard, and, though difficult to work, it is of value for cabinet purposes. The heartwood is rich brown in color, while the sapwood which surrounds it is light yellow. Both take a fine polish. The tree thrives in a warm climate, with little rainfall. The soil upon which it grows is often rocky and poor. Whether it will stand any frost cannot be stated, but it seems likely that it may succeed in parts of California and Arizona, and perhaps also in Florida. Small trees often flower profusely. It should be given a trial as an ornamental in the regions mentioned." (Popenoe.)

Hydnocarpus alpina Wight. (Flacourtiaceae.) 44896. Seeds froom Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. **var. elongata.** Apparently an unpublished varietal name. The species may be described as follows: A large tree, 70 to 100 feet in height, with very variable leaves (red when young and deep green when old), up to 7 inches in length and 2½ inches in width, and dioecious flowers in axillary racemes. The fruit is globose, about the size of an apple, with a brown, hairy surface. The seeds yield an oil which is used as fuel, and the wood is employed for general carpentry. It is a native of the Nilghiri Hills in southern India. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 4, p. 308, and from J. D. Hooker, Flora British India, vol. 1, p. 197.)

Leptospermum scoparium Forester. (Myrtaceae.) 44848. **Manuka** seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. "No. 1. Very hardy.

Used for firewood as it gives great heat. Very pretty when in flower. Grows 6 to 10 feet high." (Wright.) One of the most abundant of New Zealand shrubs, reaching occasionally a height of 30 feet, with hard, leathery, sharp-pointed leaves, and white or pinkish, odorless flowers up to ¾ inch in width. This plant flowers so profusely that the entire country appears as though covered with snow. The entire plant is very aromatic, and the leaves have been used for making tea. The wood is used for fences and firewood. (Adapted from Laing & Blackwell, Plants of New Zealand, p. 272.)

Maximilianea vitifolia (Willd.) Kr. & Urban. (Cochlospermaceae.) 44821. Seeds from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 107a.) **Tecomasuche.** A common shrub or small tree of eastern and central Guatemala from the highlands at about 4000 feet down to a level of 1000 feet or perhaps lower. The plant occasionally reaches a height of 35 feet, is always stiff, rather sparsely branched, and bears stout branchlets which usually carry leaves only toward their tips. The plant is leafless from December or January to May, in most sections, and, at this period, produces at the ends of the branchlets numerous large yellow flowers, single, brilliant in color, with a deep orange center. They are followed by oval seed pods as large as a hen's egg." (Popenoe.)

Mesembryanthemum chilense Molina. (Aizoaceae.) 44814. **Doca** seeds from Chile. Presented by Mr. G. F. Arms, Coquimbo, Chile. "**Doca,** or **Frutillas del Mar** (Strawberries of the sea). Collected on the sea beach near Serena, Chile." (Arms.) A glabrous, succulent plant about a meter (3¼ feet) in length, with opposite, triangle green leaves from 4 to 7 cm. (1 3/5 to 3 inches) long, solitary purplish flowers, and fleshy fruits. It grows flat on the sand on the sea coast from Coquimbo to Rio Bueno, Chile. The fruit is edible, having an agreeable taste, but if eaten in abundance has a purgative effect. (Adapted from A. Murillo, Plantes Medicinales du Chili, pp. 99, 100, 1889.)

Nageia excelsa (D.Don.) Kuntze. (Taxaceae.) 44850. Seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. "This is the one tree exclusively used in this country for making butter boxes, the

wood being odorless and of a nice white color. The tree grows very tall, and often has a trunk 5 or 6 feet in diameter." (Wright.) Native Maori name **Kahikatea.**

Otophora alata Blume. (Sapindaceae.) 44899. **Pisang tjina** seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. A tall Javanese tree, with compound, glabrous, green leaves, and purplish flowers in pendulous axillary racemes or sometimes solitary. The fruits are not much eaten, but hang in graceful clusters, remarkable for their beauty. The juice of the fruit is said to be useful in removing stains from linen. (Adapted from Van Nooten, Fleurs & Fruits de Java, Part 3, 1863.)

Passiflora edulis Sims. (Passifloraceae.) 44854. **Passionfruit** seeds from Avondale, Auckland, New Zealand. Presented by Mr. H. R. Wright. "**Giant.** An improved strain of the common passionfruit as grown in New Zealand and Australia. Largely grown commercially. Will grow anywhere, where frosts are not too heavy in winter." (Wright.)

Persea americana Miller. (Lauraceae.) 44856. **Avocado** budsticks from Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Bureau. "No. 146. Avocado No. 30. **Tertoh.** A famous avocado from Mixco, noted for its large size (3 pounds) and excellent quality. Unfortunately, the ripe fruit has not been seen by me, hence it is introduced on the recommendation of several Americans who are familiar with it. The parent tree is growing in the sitio of Leandro Castillo, in the town of Mixco, near Guatemala City. The elevation is about 5700 feet. The tree is said by the owner to be about 20 years old. It is about 25 feet high, broad and spreading in habit, with a trunk 15 inches thick at the base, branching 7 feet from the ground to form the dense crown 30 or more feet broad. A peculiarity of the tree is its very brittle wood. This may be against the variety in California and Florida, where strong winds occasionally do much damage. The budwood is good. The climate of Mixco is cool, but not cold enough to test the hardiness of the variety. This can be determined only by a test in California or Florida. The tree flowers in March. It is said by its owner to bear at least a few fruits every season. It produced very few from the 1916

bloom, but set a good crop in 1917, and there should be a fine lot of fruits to ripen next year (1918). Judging from accounts given me, the tree usually does not carry a great many fruits, but this would be expected of a variety of such large size. The season of ripening is said by the owner to be from February to April, most of the crop being picked in March. The fruits, as indicated by young ones now on the tree (June 12, 1917), are long and slender,--best termed slender pyriform, perhaps, but not markedly swollen at the lower end. The surface is nearly smooth, and the skin rather thin for this race. When ripe the color is said to be deep purple, and the flesh is said to be of excellent flavor. An American who has known the variety for some time tells me he has weighed specimens which tipped the beam at 3 pounds. This is a larger fruit than any other included in the collection and, so far as I am aware, the largest yet seen in Guatemala. Since it has not been possible for me to examine the mature fruit, it is recommended that budded plants be distributed with the understanding that the variety is a very large-fruited one highly recommended by several people who are familar with it, but not tested by me." (Popenoe.)

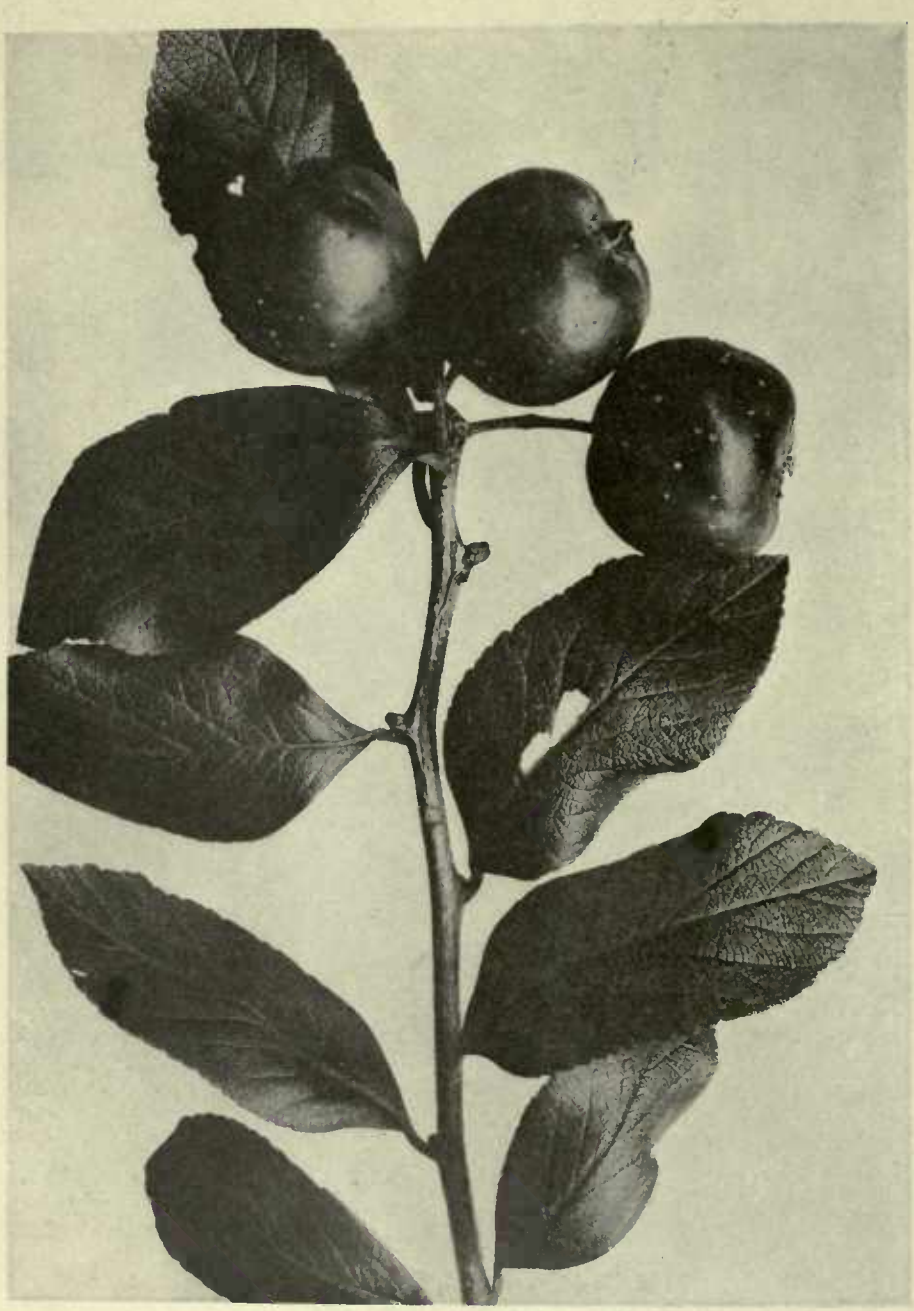
Polygonum tinctorium Loureiro. (Polygonaceae.) 44805. Seeds from Yihsien, Shantung, China. Presented by Rev. Ralph G. Coonradt. "The 'Blue plant' may be common in America. When mature, it is put through a process to obtain the dye with which all of our blue clothes are colored." (Coonradt.) An annual herb commonly cultivated in dry fields in China and Japan, growing to a height of 1 to 2 feet. The leaves are variable in shape, ranging from long and narrow to short and oval, and the pink flowers are borne in spikes. The dried leaves are made into "indigo balls" from which the dye is obtained. (Adapted from Useful Plants of Japan, p. 101, 1895.)

Prunus salicifolia H.B.K. (Amygdalaceae.) 44885. **Cherry** seeds from Guatemala City, Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 128a. May 16, 1917.) The wild cherry of the Guatemalan highlands, called **cereza** in Spanish and **capulin** in the Quiché Indian dialect. The tree is found both wild and cultivated in the mountains of Guatemala, from elevations of about 4000 feet up to 9000 feet or perhaps higher. As commonly seen, the tree is erect, often somewhat slender,

THE PACAYA PALM OF GUATEMALA.

(CHAMAEDOREA SP., S. P. I. NO. 44059.)

The pacayas are the inflorescences resembling ears of corn in shape, which are borne on the trunk. (Three of these are shown in the photograph.) These are produced all the year round and form an important article of diet among the Guatemalans. When the outer covering of a pacaya is removed, the tender, yellowish white inflorescence may be eaten raw, like palm-bud salad, or it may be fried in an omelet or in an egg batter, or it may be boiled like cauliflower. The flavor of very young pacayas is delicate and agreeable, but that of the older ones unpleasantly bitter. As this palm, which, according to Mr. Wilson Popenoe, is grown in nearly every dooryard in Coban, Guatemala, thrives at an altitude of 5,000 feet and can withstand lime, it is worthy of a careful trial in Florida and California. (Photographed by Wilson Popenoe, San Antonio A. C., Guatemala, October 19, 1916; P16874FS.)



THE LARGE-FRUITED HAWTHORN OF GUATEMALA.

(*CRATAEGUS STIPULOSA* STEUD.)

In the markets of Guatemalan towns this Manzanilla is a common fruit. It comes from the highlands, where it is extensively used for the preparation of jams and jellies, for which purpose its deep yellow, applelike fruits are admirably suited. The flavor of these fruits resembles that of our own hawthorn, but is somewhat better. This species ought to thrive in California and Florida. See S. P. I. No. 43430. (Photographed by Wilson Popenoe at Antigua, Guatemala, October 20, 1916; P16885FS.) Natural size.

reaching a height of about 30 feet, the trunk stout and occasionally as much as 3 feet thick, and the bark rough and grayish. The young branchlets are dotted with grayish lenticels. The leaves, which are borne upon slender petioles ¾ inch long, are commonly 4½ inches in length, 1¼ to 1½ inches in breadth at the widest point, and oblong-lanceolate in outline, with a long, slender tip. The upper surface is dull green, the lower surface glaucous, and the margin is rather finely serrate. The flowers, which are produced from January to May, are white, about ⅜ inch wide, and very numerous on slender racemes 2 to 4 inches in length. As many as 15 or 20 fruits sometimes develop on a single raceme, but many drop off before reaching maturity, with the result that 2 to 5 ripe fruits are commonly found on each raceme. The season of ripening in Guatemala is from May to September. The ripe fruits, which are slightly oblate in form and up to ¾ inch in diameter, separate readily from the short fruit stalks, leaving the green, 5-toothed calyces adhering to the latter. In color the fruit is deep glossy maroon-purple. The skin is thin and tender, but so firm that the fruit is not easily injured by handling. The flesh is pale green, meaty but full of juice. The flavor is sweet, suggestive of the Bigarreau type of cherry, with a trace of bitterness in the skin. The stone is a trifle large in comparison to the size of the fruit. Pleasant to eat out of hand, this cherry can also be eaten stewed, or made into preserves or jams. In Guatemala it is most commonly eaten out of hand and as a sweet preserve. This species does not appear to be adapted to hot tropical seacoasts, but it seems to be distinctly subtropical in character. It may succeed in moist subtropical regions such as Florida, where other types of cherries do not thrive." (Popenoe.)

Ruprechtia fagifolia Meisner. (Polygonaceae.) 44878. **Duraznillo** seeds from Estacadita, near Sabanita de Coro, Venezuela. Presented by Mr. H. M. Curran. "**Komari.** A small tree. May, 1917." (Curran.) South American tree with smooth bark which, in renewing itself each year, wrinkles in a peculiar way, giving the tree a characteristic appearance. In the spring it is covered with yellowish flowers which later become pinkish, making the tree very ornamental. The wood is of no commercial use, so far as is known. (Adapted from Lillo, Contribución al Concimiento de los Arboles de la Argentina, p. 83.)

Saraca declinata (Jack.) Miquel. (Caesalpiniaceae.) 44900. **Kisokka** seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. An ornamental tree, rarely more than 20 feet high, with alternate, pinnate leaves composed of 6 to 8 pairs of oblong-lanceolate leaflets which are purplish brown when young. The bright yellow, reddish-tinged flowers occur in corymbs, sometimes on the trunk, and make a pleasing contrast with the crimson peduncles of the corymb. The oblong, flat pods are about a foot long, and are of a beautiful purplish crimson while immature. (Adapted from Van Nooten, Fleurs & Fruits de Java, Part 3, 1863.)

Strophanthus caudatus (Burm.) Kurz. (Apocynaceae.) 44901. **Kikoeija** seeds from Buitenzorg, Java. Presented by Dr. J. C. Koningsberger, Director, Botanic Garden. A very ornamental, shrubby vine, with white-dotted dark brown bark; simple, opposite, smooth, oval-acuminate, green leaves; and large, showy, red and white flowers occurring either singly or in corymbs. The fruits are follicles sometimes 2 feet in length, and the seeds, which are provided with long, silky hairs, are very pretty. This vine is a native of the East Indies, where the women use the flowers to adorn their head dresses. (Adapted from Van Nooten, Fleur & Fruits de Java, Part 7, 1864, under *S. dichotomus.*)

Telopea speciosissima (Smith) R. Brown. (Proteaceae.) 44837. **Waratah** seeds from Sydney, Australia. Presented by Mr. J. H. Maiden, Director, Botanic Gardens. A stout, erect, glabrous shrub 6 to 8 feet high, with leathery, cuneate-oblong leaves, 5 to 10 inches long, and very handsome crimson flowers in dense heads or racemes 3 inches in diameter. The fruit is a leathery, recurved follicle 3 to 4 inches long, containing 10 to 20 seeds. It is a native of New South Wales. (Adapted from Bentham & Mueller Flora Australiensis, vol. 5, p. 534.)

Trifolium pratense L. (Fabaceae.) 44906. **Red clover** seeds from Petrograd, Russia. Presented by Mr. I. A. Pullman, through Dr. Robert Regel, Bureau of Applied Botany. "(March 25, 1917.) Late, tufted. Second generation; I. A. Pullman, selector. Crop of 1916. From 2.7 acres were harvested 10,000 pounds of hay and 600 pounds of seeds." (Pullman.) Introduced for the Office of Forage Crop Investigations.

Vittadinia triloba (Gaud.) DeCandolle. (Asteraceae.) 44838. Seeds from Sydney, Australia. Presented by Mr. J. H. Maiden, Director, Botanic Gardens. An herbaceous plant, either erect and apparently annual or with diffusely ascending stems from a perennial woody base, usually not more than a foot high. The leaves are entire or coarsely 3-lobed, and the purplish flower-heads are solitary and terminal. It is a native of southern Australia, and might be useful as an ornamental in borders. (Adapted from F. M. Bailey, Queensland Flora, Part 3, p. 811, under *V. australis.*)

Voandzeia subterranea (L.) Thouars. (Fabaceae.) 44817. **Woandzu** seeds from Umkomaas, Natal, South Africa. Presented by Rev. H. D. Goodenough. "The natives plant these when the first rains come, on new ground, preferably a sandy loam. They look very much like peanuts, but in cooking they are boiled in their shells." (Goodenough.) A yellow-flowered annual with upright, long-stalked compound leaves composed of 3 leaflets. Like the common peanut, the flower stalks bend down to the earth after flowering, and the pods are ripened underneath the ground. In the requisite cultural conditions the plant much resembles the common peanut. (Adapted from H. F. Macmillan, Handbook of Tropical Gardening and Planting, pp. 232, 233.)

Zea mays L. (Poaceae.) 44830. **Corn** from Johannesburg, South Africa. Purchased from the Agricultural Supply Association. "*Izotsha* maize is a strain (apparently of Boone County White) which is successfully grown in a limited area on the South Coast of Natal, bordering Pondoland, an area which is subject to great extremes of drought and heat during the summer. It is claimed by farmers in that locality that it is the only variety of maize which has been found satisfactory in that particular vicinity, but as they are isolated from the main maize belt of South Africa, it is quite possible they have not tried some of the more drought-resistant types which are now being grown in other parts of the Union. It occurred to me that owing to its obvious drought-resisting qualities, this variety might be of use to farmers in the southeastern states, especially in parts of Florida and the adjacent states subject to considerable drought." (Letter of Mr. J. Burtt-Davy dated August 18, 1917.) Introduced for the use of the Office of Cereal Investigations.

Notes on Behavior of Previous Introductions.

Mrs. Wilhelmine Seliger, 15 Waverly Ave., Hartford, Conn., in a letter dated October 7, 1917, states:

"In conclusion of my selection for new trial plants or seeds, I wish to write of my experience in raising the Chinese cabbage, *Brassica pekinensis*, the seeds of which I received last spring from your Bureau.

"I have eaten today the first dish of this fine, delicious variety of cabbage from my own raising. It is a desirable sort prepared either boiled, or eaten raw as a salad while crisp; the bleached leaves have a fine-grained texture and a mild agreeable flavor. For our New England climate, it is absolutely necessary to sow the seed early if heads are desired. I sowed part of my seed for trial when my peas were up above ground. The result was that I got nice, oblong heads which were not attacked by the common cabbage worm which on other cabbages of our common kinds were very abundant. As the directions said to sow the seed late in July, I did this; but this second sowing, here in Connecticut, is too late for forming heads. I suppose when frost has affected it, the green leaves, which look nice, can be eaten as we do kale. I shall try to preserve them by protection in a sheltered place for the winter. None has gone to seed of the early sowing. In short, it is a desirable addition to our vegetables and I honestly recommend it for use in any home garden or market. I exhibited a large head at a meeting of our State Horticultural Society a week ago, and received the hearty thanks of the members and a certificate of merit."

Mr. Will B. Munson, of The Munson Nurseries, writes from Denison, Texas, Nov. 14, 1917, concerning various persimmons and jujubes which he has been testing:

"We find the Tamopan very hardy here and the tree very vigorous. The fruit is handsome, but it does not remain firm as long as the Japanese varieties; hence its keeping season is not so long. Its flavor is not so high in quality as most of the Japanese varieties. However, it is quite valuable on account of its hardiness, vigor, productiveness, and uniformly fairly large size.

"We have three varieties of the jujube, one of which is quite good. They bear very fully and every year, regardless of weather conditions. When their

uses are known it will become quite a fruit in this section of the country. We preserved some this season by boiling in sugar water. To prepare for preserving dry out and reboil, dry and reboil, and then dry. After drying, they were placed in a form and pressed into a package resembling dates. They are as good to eat as cured dates.

INVENTORY OF SEEDS AND PLANTS IMPORTED.

Owing to the war demands upon the government printing funds, it has been necessary to suspend temporarily the publication of the inventories of seeds and plants, which under normal conditions should appear every three months. There are now prepared sevveral of these inventories which have been ready for the printer for many months.

While it is out of the question to publish these inventories in Plant Immigrants, it does seem advisable to reproduce here the brief Introductory Statements to these inventories which direct attention to the more important introductions. One of these statements will appear in each issue of Plant Immigrants.

Introductory Statement to Inventory No. 46, covering the period from January 1st to March 31st, 1915.

This Forty-sixth Inventory of Seeds and Plants shows the effects of the great war which has narrowed down the avenues of shipping and closed up countries from which many valuable plants were being secured through correspondence. It has delayed shipments to such an extent that it has not been practicable, in many instances, to arrange for the shipping from far interior points in India and China of anything more perishable than seeds. Furthermore, during the period covered by this inventory, no official agricultural explorer was in the field so that the descriptions are all of material sent in by correspondents or collaborators.

The most interesting of the introductions, judged before they are tested, appear to be the following;

Thirty-five selected varieties of wheat (Nos. 42102 to 42136), the result of much work of selection and acclimatization by the plant breeders of Victoria, some of them being of late foreign introduction into Australia while others are selections from types of old Australian wheats. These were supplied by Mr. A.

E. V. Richardson. Twenty-six varieties of wheat from the United Provinces of India (Nos. 41991 to 42016), representing some old Indian types, were presented by Mr. H. Martin Leake of Cawnpore. While these may none of them prove especially valuable it should be kept in mind that it was out of a cross between an Indian wheat, Ladoga, and the Red Fife that the famous Marquis wheat of Canada came.

The discovery of a nematode-resistant variety of hops, *Humulus lupulus* (No. 42024), by the plant breeders of the Southeastern Agricultural College of England should attract the attention of hop growers to the disease known as Nettle-head or Skinky, and the trial of this new variety may prove valuable in our hop fields.

Since Mr. C. V. Piper's preliminary study of the forage plants of India, during his trip there in 1911, he has continued to test many of the wild and cultivated grasses of that region, and Nos. 41885 to 41900, 41902 to 41907, 41910 to 41916, 41918 to 41921, represent a remarkable collection from Kirkee, India, presented by Mr. Wm. Burns, the Economic Botanist of the Station there, including *Andropogon annulatus* (No. 41885), a species well adapted to the Gulf States; *Cenchrus biflorus* (No. 41894), related to our sandbur but considered in Northern India as one of their most nutritious grasses; *Chloris paraguaiensis* (Nos. 41759 and 41897), related to the Rhodes Grass, but native of Burma and Ceylon and considered a good fodder grass in Northern India, and in Australia one of the best grasses for pasturage and hay; *Chrysopogon montanus* (No. 41899), a handsome species, three to five feet tall, which already shows promise in Florida and Mississippi; *Iseilema wightii* (No. 41914), natural pasture grass of India; *Pennisetum ciliare* (No. 41915), a most valuable pasture and hay grass there; and *Thelepogon elegans* (No. 41918), which grows in the Indian rice fields, and can hardly be distinguished from rice until it flowers.

The breadnut tree of Yucatan, *Piratinera alicastrum* (No. 41880), the leaves of which are extensively used for forage purposes there, deserves trial in southern Florida, according to Dr. Lavedan who sends the seeds.

Through Mr. Roland McKee, who secured the Australian Exhibit of the Panama Pacific Exposition, a collection of Australian fodder grasses is now being tried (Nos. 41744 to 41762). It includes the extremely productive Kangaroo grass, the Cockatoo grass, the Rice grass, Sugar grass, three species of grasses

related to the Rhodes grass, and *Panicum distachyon* (No. 41746) which ranks as one of the best of the indigenous grasses of northern Australia.

The true tropical yams (*Dioscorea spp.*) have grown so well in Florida, and the quality of their tubers is so excellent that the introduction from Panama by Mr. O. W. Barrett of three selected strains (Nos. 42052 to 42054) is of special interest.

A palm, *Chamaedorea tepejilote* (No.41705), the inflorescence of which forms a regular source of excellent food in the Vera Cruz province of Mexico, according to Dr. C. A. Purpus, and which will grow on sandy soil, might accommodate itself to conditions in Florida. And a tall-growing variety of the ordinary bean, the Tawana or Taguana (No. 42049), which climbs 15 to 20 meters into the tops of the high trees in Paraguay and which produces heavy crops of beans, will be interesting to bean growers even though it may not be a valuable acquisition.

The existence in Dominica of an indigenous walnut, *Juglans domingensis* (No. 41930), related to our black walnut, will interest those engaged in the hybridization of the species of *Juglans*; and the gathering together for propagation and distribution by Mr. C. A. Reed of the hardiest and best seedlings of the Persian or English walnut, *Juglans regia* (Nos. 42022 and 42023, and Nos. 42041 to 42044), from New York State and Canada, cannot fail to attract attention to the neglect which horticulturists of our Eastern States have shown to the possibilities of walnut culture on this side of the Rockies.

The Queensland nut, or Macadamia (No. 41808), has grown and fruited so well in California and Florida and its nuts are so delicious that it is a wonder more has not been done with it, - especially in Hawaii where trees were planted 30 years ago and where they have borne good crops, according to Mr. C. S. Judd of the Board of Commissioners of Agriculture, who sends in a quantity of seeds.

Although it is extremely doubtful if the Tangutian almond, *Amygdalus tangutica* (Nos. 41708 and 41709), can be used as a stock for the almonds, it should certainly be hybridized with the ordinary almond, if possible, and the production of a bush almond at least attempted. The large amount of seeds sent in by Rev. C. F. Snyder from Kansu may bring this hybrid about.

Although in quality American varieties of the peach lead the world, there are yet possibly to be

found varieties less susceptible to the many peach diseases than are those we have; and the collection from Saharanpur, British India, (Nos. 41731 to 41743) may contain such varieties.

The search for grapes suited to the conditions of the Southern States and possibly capable of hybridizing with the Muscadine has brought in *Vitis tiliaefolia* (No. 41707) from Vera Cruz, Mexico, and *Vitis davidii* (No. 41877) from Central China.

The subtropical and East Indian plum, *Prunus bokhariensis* (No. 42057), from Simla which resembles *Prunus salicina*, may play a role in the production of a plum for our Southern States. The Service Tree of southern Europe, *Sorbus domestica* (No. 41703), which grows into such a stately beautiful tree and bears palatable fruits, appears to have been strangely neglected by horticulturists. Although already very many varieties of Japanese persimmon have been introduced, the extensive collections from Okitsu (Nos. 41691 to 41702, Nos. 41779 to 41793, and Nos. 42138 to 42165) may contain some better suited to our conditions or less astringent than those we are testing.

The Brazilian Expedition, sent out by this office in 1913, discovered in the campo near Lavras a strange and quite remarkable fruit (*Eugenia klotzschiana*), characterized by a remarkable fragrance. Through the kindness of Mr. Hunnicut a quantity of seeds has been secured (No. 42030) and the species will be given a thorough trial.

Solanum quitoense (No. 42034), the Naranjilla of Quito, with fruits the size of small oranges, which form the principal article of food of the settlers during certain seasons, should certainly be given a trial in this country.

So much and such genuine interest has been aroused in the Japanese flowering cherry trees, through the gift to the City of Washington by the Mayor of Tokyo of a collection of them, and through the satisfactory growth which specimen trees have made in Maryland, Massachusetts, and California, that a demand for them has grown up which nurserymen find it difficult to meet. It is of interest, therefore, to point out that 54 varieties from the municipal collection of Tokyo near Arakawa, which represent the loveliest of the hundreds of varieties known to the Japanese, have been secured through the Mayor's courtesy, and these will be propagated and distributed under the same varietal names as they bear in the Arakawan collection (Nos. 41817 to 41870).

The *Paulownia tomentosa* has become such a feature tree in our parks that a new species with larger flowers, from Formosa, *P. fortunei* (No. 42036), will be watched with interest. Bentham's Cornel from Nepal, *Cornus capitata* (No.42287), with heads of yellowish flowers and deep orange fruits, the size of nectarines, will interest those with whom the American dogwood is a favorite.

The Oriental bamboos are not the only species of value for timber, and those living in the tropics will want to test the Takuara of Paraguay, *Bambos guadua* (No. 42066), a species evidently too tender for Florida.

Those interested in tropical timber trees will find some remarkable ones in the collections introduced from Madagascar (Nos. 42355 to 42376), Argentina (Nos. 42321 to 42332), or in the famous Jequitiba of Brazil, one of the largest and most beautiful of all tropical forest trees introduced for the first time by the Forest Expert, Mr. H. M. Curran, from Bahia (No. 41933).

David Fairchild.
Agricultural Explorer in Charge.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Frank N. Meyer and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, R. N. Jones, P. G. Russel, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge. (Yarrow) Plant Introduction Field Station, Rockville, Md.
Harry Duffield, Jr., Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Aaron Aaronsohn, Haifa, Palestine; Thomas W. Brown, Cairo, Egypt; H. M. Curran, Laurel, Md.; M. J. Dorsey, University Farm, St. Paul, Minn.; Robt. H. Forbes, Tucson, Ariz.; Gustav Eisen, New York City; E. C. Green, Natal, Estado do Rio Grande do Norte, Brazil; A. C. Hartless, Saharanpur, India; Barbour Lathrop, Chicago, Ill.; C. C. Logan, Luray, Va.; H. Nehrling, Gotha, Fla.; Miss Eliza R. Scidmore, Washington, D. C.; Charles Simpson, Littleriver, Fla.; H. P. Stuckey, Experiment, Ga.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; H. N. Whitford, School of Forestry, New Haven, Conn.; E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

RECEIVED
JUL 1 1918
Division of Forestry
University of California

PLANT IMMIGRANTS.

No. 135. JULY, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Andropogon	1199	Musa	1205
Annona	1199, 1200	Panicum	1205
Asimina	1200	Persea	1205, 1206
Canavali	1201	Rymandra	1207
Chamaedorea	1201, 1202	Solanum	1207
Cocos	1204	Tabebuia	1208
Diphysa	1204	Zea	1208
Ixerba	1205	Ziziphus	1208

Plates:

Pl. 221. Lake Amatitlan, The Home of the Guatemalan Avocado.
222. The Injerto Tree of Guatemala, *Achradelpha viridis.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

June 22, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Andropogon erianthoides F. Mueller. (Poaceae.) 45037. **Satin-top** grass from Burringbar, New South Wales, Australia. Presented by Mr. B. Harrison. An erect, glaucous grass, 2 or 3 feet high, with rather narrow leaves and usually 3 to 4 sessile, erect spikes about 3 inches in length. It is a native of New South Wales and Queensland, where it is considered a very superior grass for forage purposes. It produces a heavy crop of rich, succulent foliage, spreads from the roots, and also seeds freely. (Adapted from Bentham & Mueller, Flora Australiensis, vol. 7, p. 529, and from J. H. Maiden, Useful Native Plants of Australia, p. 73.)

Andropogon intermedius R. Brown. (Poaceae.) 45038. **Rare bluegrass** from Burringbar, New South Wales, Australia. Presented by Mr. B. Harrison. An erect grass, with rather narrow leaves and slender spikes, growing in large clumps 2 feet or more in height. It is a native of Australia, where it is used as a forage grass. It is readily propagated from the roots. (Adapted from Bentham & Mueller, Flora Australiensis, pp. 531, 532, and from Agricultural Gazette, New South Wales, May 2, 1914.)

Annona cherimola Miller. (Annonaceae.) 45020. **Cherimoya** cuttings from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 164. From the sitio of Julio Guerra Antigua. July 16, 1917.) An unusually productive and otherwise desirable cherimoya from the garden of Julio Guerra, who keeps a small tienda across the street from the rear of the Hotel Rojas. This is the most productive tree I have seen in this entire region, though I have examined a large number, not only in Antigua but in many of the surrounding villages. There is one peculiarity worthy of mention: Both this tree and the one from which I obtained budwood (No. 49) in Duenas, have been topped within the last few years and the present crown is all new wood. These two trees were the only ones I have seen bearing good crops of fruit, and this naturally brings up the question: Is the productiveness of these trees due to the fact that they have been topped? It rather looks as though it may be; and it would be well worth while experimenting with some of the old seedling trees in southern California to see if topping would render them more productive. Topping is not done here with the intention of making the trees produce more fruit; it has been purely accidental

in these two cases. The large limbs have been cut back within a foot or two of their union with the trunk. From the stubs numerous sprouts have made their appearance, and on these much more fruit is produced than upon the fruiting branches of the ordinary crown. The tree from which this budwood was taken has a trunk about 10 inches in diameter, and the crown is now about 10 feet broad. I counted over 50 fruits on the tree, which is a large crop for a cherimoya. The fruits are heart-shaped or bluntly conical; much freer from irregularities than many varieties; and of large size, averaging about a pound in weight. The surface is clean and almost smooth, the carpellary areas being indicated by raised lines. This is a variety of pleasing form and appearance, of good size for handling and marketing, and the quality seems to be good. It ripens earlier here than most of the other seedlings, the first fruits having already dropped, while the fruits on most of the other trees I have seen are still immature. It should be tried in California." (Popenoe.)

Annona cherimola Miller. (Annonaceae.) 45021. **Cherimoya** cuttings from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 165. From the sitio of Julio Guerra, Antigua. July 16, 1917.) A prolific variety of the *cherimoya,* or *anona,* as it is called in the Guatemalan highlands. The tree is small, though not young. Apparently it has been cut back heavily, leaving only one limb of the several which formerly composed the crown. The height of the tree at present is about 15 feet, while the trunk is about 8 inches thick at the base. The crown is slender and unsymmetrical. At this date (July 16) the tree is carrying 102 young fruits, and is still flowering. The season of ripening is from November to January. In form the fruits are cordate to conical. When ripe the larger ones will weigh more than one pound. The surface is rough, the carpellary areas on some specimens giving rise to short protuberances, while on other specimens the protuberances are almost wanting. Julio Guerra says 'the ripe fruit has very white flesh and is of good quality.' The unusual productiveness of the parent tree commends the variety for trial in California and Florida." (Popenoe.)

Asimina triloba (L.) Dunal. (Annonaceae.) 45019. **Papaw** cuttings from De Kalb, Missouri. Presented by Mr.

J. C. Roach. "(July 23, 1917.) **Long John papaw.** Grown on the John Cole farm, 3 miles south of De Kalb." (Roach.) The fruit of this variety is of unusual shape, being very long in proportion to its breadth (sometimes almost like a banana in form), and weighs 7 or 8 ounces. The quality is good but not equal to that of several others, and the fruit is a good shipper, perhaps the best of all, the skin being notably tough and thick. (Adapted from Journal of Heredity, January, 1917, in which is published the offer of the American Genetic Association which brought this and many other varieties of papaw together for comparative study.)

Canavali ensiforme (L.) DeCandolle. (Fabaceae.) 44938. **Sword bean** seeds from Mombasa, British East Africa. Presented by Kerslake Thomas & Company. Gotian Estate, Changamwe, at the request of Mr. Henry P. Starrett, American Consul, Mombasa. "**Go-ta-ni bean.** It is an exceedingly heavy cropper, yielding about 2200 pounds per acre under ordinary conditions. It is very hardy and a great drought-resister. In this country it is a perennial, 2½ feet in height, and grows well on a clay loam and also on a light sandy soil. It would probably do well in southern United States and California. Upon analysis it is found that the bean contains an exceptionally high percentage of albuminoids and oil, while the moisture is low. The high percentage of fiber is accounted for by the tough consistency of the outer covering of the bean. There is nothing to indicate that it would not be fit for food, although the tough outer covering would better be removed. No prussic acid has been detected in the macerated product." (Kerslake Thomas & Co.)

Chamaedorea sp. (Phoenicaceae.) 44994. **Palm** plants from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 150. July 9, 1917.) A dwarf palm collected in dense forests near Purulá, Department of Baja Verapaz, at an elevation of approximately 5500 feet. This species is usually called by Spanish-speaking Guatemalans **pacayito,** which means "small pacaya." By the Indians of the Alta Verapaz, who speak the Quekchi language, it is called **ko-kiip** which also means "small pacaya," and in Purulá I heard it called **pamak.** This name is doubtless given because of the resemblance to the common **pacaya,** a palm which is extensively cultivated in Guatemala for its edible flower buds. Probably

the name **pacayito** may be chosen as best suited to use in the United States. Judging from accounts given me by various residents of the Verapaz, this palm commonly occurs in the mountains of that region at elevations of about 4000 to 6000 feet. It always grows in dense forests, and must be considered a shade and moisture-loving species. The soil in which it grows is nothing but decayed leaves for the first several inches, which is kept continually moist by the abundant rains of this region. In Coban the **pacayito** is a favorite house plant, being grown in pots and tubs and used to decorate living rooms and patios. In the city of Guatemala it is occasionally used for the same purpose, the plants being brought down from Coban. In the forests, the **pacayito** seems never to reach a greater height than 3 feet. It is a true dwarf (one might almost call it a miniature palm), for it reaches maturity and comes into flower when not over a foot high. This dwarf habit makes it of unusual interest as a pot plant for the north, as it can be fruited in an ordinary living room when growing in an eight-inch pot. It makes its character leaves almost as soon as the young plant is out of the seed. I have seen many plants in the forest, not over 4 inches tall, which already had 2 to 4 fully characterized leaves. When quite small it strongly resembles *Cocos weddelliana,* but the pinnae are somewhat broader and not so numerous. For fern dishes in the northern states it should have great value. When mature, the plant has a slender trunk, perhaps half an inch thick and two feet high. The leaves are a foot to eighteen inches in length, rather finely pinnate, deep green, and graceful, with the rachis stiff but arching slightly. In the Verapaz the flowers are produced in June and July and the small, round seeds, about as large as small peas, ripen in December. Since it is found at considerable elevation in the Verapaz, it seems likely that this palm will be sufficiently hardy for cultivation in the open in California and Florida. It should be provided with ample shade, however, and planted in a very moist situation in soil containing a large proportion of leaf mold. As a house plant for the northern states, and for use in fern dishes, it seems to me that this plant possesses unusual possibilities, and I strongly recommend it for trial." (Popenoe.)

Chamaedorea sp. (Phoenicaceae.) 45022. **Pacaya palm** seeds from Guatemala. Collected by Mr. Wilson Popenoe,

of this Bureau. "(No. 167a. From San Cristobal, Department of Alta Verapaz, July 16, 1917.) Nearly every garden in Coban, San Cristobal, and other towns of the Alta Verapaz, contain a number of these attractive palms, grown not so much for ornament as for the edible inflorescences which they produce. In some parts of central Guatemala, such as San Antonio Aguas Calientes, the pacaya is occasionally seen, but it appears to be much more abundant in the Verapaz than in any other section of the republic. It is cultivated at varying elevations, the lowest observed being about 3000 feet and the highest 5200. From the fact that it succeeds at such high elevations as 5000 feet it must be considered slightly hardy, and may be found sufficiently so to be grown outdoors in southern California and Florida. The palm grows to a height of 15 to 25 feet, more commonly the former than the latter. The trunk is slender, erect, and about 2 inches thick. The leaves are 3 to 6 feet long, with 18 to 24 pairs of pinnae, subopposite toward the base of the rachis. The lowermost pinnae are narrow and are not over 8 to 10 inches long; farther up they become 18 or 20 inches long and nearly 2 inches wide. In general, the foliage of this palm suggests that of the well known *Areca lutescens* (properly *Chrysalidocarpus lutescens*) of northern conservatories. It is graceful, of rich green color, and in every way pleasing. The inflorescences appear from October to May, a few coming at other seasons of the year. They appear along the trunk, a short distance beneath the lowermost leaves. Before the spathes burst and the flowers appear, these buds, which are 8 to 12 inches in length, are cut for use. The part which is eaten is the tender, white, much-branched inflorescence within the spathe. Its preparation for the table consists in dipping it in a batter made of eggs and then frying it; in enveloping it in an omelet; in boiling it and serving it as a vegetable; or in mixing it with other vegetables to form a salad. When very young and tender its flavor is most agreeable. When the buds are nearly ready to burst, the infloresence frequently has a bitter taste which is objectionable to some people, though much liked by others. This palm grows on a variety of soils, seeming to do well on clay and also on black sandy loam. It is frequently planted in gardens among coffee bushes, and in some sections it is planted beneath the shade of large trees. It may be necessary to supply shade for the plant in regions such as southern California. If

so, this could be easily done by means of a lath or slat house. As an article of food the pacaya is much used in Guatemala, and at local stands it commands a good price, single inflorescences selling commonly at 5 or 6 for a peso (2½ cents) in the regions where they are grown. The leaves are widely used for decorative purposes, being cut to adorn houses during the many fiestas which take place in this country." (Popenoe.)

Cocos datil Drude & Griseb. (Phoenicaceae.) 45009. **Palm** fruits from Gotha, Florida. Presented by Mr. H. Nehrling. "This is the most massive hardy Cocos species which I have. The bunches of fruits usually weigh about 50 pounds each. I raised the plant from seeds received from the late Dr. Hermann Burmeister of Buenos Aires, who informed me that the seeds had been collected by Dr. Niederlein at Entre Rios, Argentina about 22 years ago. These Cocos species are the most beautiful and hardy on the high pinelands, and most of them have edible fruits which are very aromatic." (Nehrling.)

Cocos yatay Martius. (Phoenicaceae.) 45073. **Palm** seeds from Gotha, Florida. Presented by Mr. H. Nehrling. "The partially bright red fruit, larger than that of *Cocos australis*, comes from a taller, open tree, --*Cocos yatay*. There are not many fruits in a bunch, and I have not tasted them but they appear to be good. This tree was also grown from seed received from Blumenau, Brazil, in 1890, which was collected by Gaertner from wild trees growing in stony or rather dry soil. These cocoid palms (*Cocos australis, C. gaertneri, C. datil, C. campestris, C. eriospatha* and several others) have rather hard, bluish green leaves, and thrive to perfection on our high dry Florida pineland. I think they will grow all along the south Atlantic and Gulf Coast. All are fine ornamentals in any garden." (Nehrling.)

Diphysa sp. (Fabaceae.) 44997. Seeds from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau, "(No. 153a. July 9, 1917.) A leguminous shrub common in the mountains of the northern part of the Department of Baja Verapaz, between Salamá and Santo Tomas. It grows in dry, rocky places and also along the banks of streams, reaching a height of about 3 feet under the former conditions and 6 feet under the latter. The foliage is coarsely pinnate, with oval, glaucous

LAKE AMATITLAN, THE HOME OF THE GUATEMALAN AVOCADO.

The first two sets of cuttings of Guatemalan avocado varieties to be sent in by Mr. Wilson Popenoe, Agricultural Explorer of the United States Department of Agriculture, were collected on the opposite shore of this mountain lake, in the section known as Rellew, where numerous coffee fincas or plantations occur. (Photographed by Wilson Popenoe, Laguna, Guatemala, October 9, 1916; P16846FS.)

Pl. 222.

THE INJERTO TREE OF GUATEMALA.

(*ACHRADELPHA VIRIDIS* (*PITTIER*) O. F. COOK, *S. P. I. No. 43788.*)

The sapote (*Achradelpha mammosa*) has not been a success in Florida or California, but this near relative, which grows at an altitude of 6,000 feet, may stand a better chance of succeeding. It does not come into bearing until it is 8 years old, but it then often produces enormous crops of round to oval fruits, of a dull yellow-green color, a sweet pleasant flavor, and a soft melting texture, which resembles but is better than that of the sapote itself. (Photographed by Wilson Popenoe on the road to San Juan del Obispo, Guatemala, October 26, 1916; P16910FS.)

leaflets. The flowers, which are produced in clusters of considerable size, are of a deep lilac color and quite attractive. In form they resemble the flowers of the common pea, but are smaller, being about half an inch broad. The shrub seems well worthy of trial in California and Florida." (Popenoe.)

Ixerba brexioides Cunningham. (Escalloniaceae.) 44955. **Tawari** seeds from Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery. A beautiful evergreen tree, sometimes 70 feet tall, with thick, leathery, coarsely serrate leaves 3 to 7 inches long, and very handsome waxy, white flowers 1½ inches wide, borne in flat panicles. It is a native of New Zealand, where it is not common; and is considered by some to be the most beautiful tree indigenous to that country. (Adapted from Laing and Blackwell, Plants of New Zealand, pp. 186, 188.)

Musa paradisiaca seminifera (Lour.) Baker. (Musaceae.) 45007. **Plantain** seeds from Nice, France. Presented by Dr. A. Robertson Proschowsky. A wild, seed-bearing plantain having small, oblong, greenish fruits full of seed. These fruits are about a third of the size of the common banana; and have a pleasant taste, although encumbered by numerous seeds. The plant is quite ornamental; and as it is hardier than the common banana it might be possible, by selection or hybridization, to extend the range of banana culture. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 2079, and from letter of Dr. A. Robertson Proschowsky, June 30, 1917.)

Panicum decompositum R. Brown. (Poaceae.) 45040. Seeds from Burringbar, New South Wales, Australia. Presented by Mr. B. Harrison. A tall, coarse, succulent, semi-aquatic grass, cultivated in many parts of Australia as a forage crop. It produces an abundance of forage, and is greatly relished by stock. It has yielded, under cultivation, as much as 3 tons of hay per acre. The seeds are produced in December and January. (Adapted from J. H. Maiden, Useful Native Plants of Australia, pp. 97, 98.)

Persea sp. (Lauraceae.) 44996. Seeds from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 152a. From the Chuacús mountains, near Rincon Grande, about 5 miles from Salamá, at an approximate

elevation of 3000 feet. July 9, 1917.) I do not know what this species may be; possibly it is as yet undescribed. Only one tree has been seen up to the present, and this was erect, rather slender in habit, 30 feet in height. The foliage strongly resembles that of *P. americana*, but is more heavily pubescent beneath than is common in that species. In form and size the leaves could not be distinguished from some of the cultivated avocados. The young leaves and branchlets are covered with a velvety tomentum. The fruits, which ripen in June, are oval or oblong-oval in outline, about an inch and a half in length, shining black in color, with a membranous skin and a very small amount of greenish pulp having a strongly resinous taste. The seed is quite large in comparison with the size of the fruit, elliptical in outline, with the seed coats thin, brownish and brittle, and adhering closely. The cotyledons are whitish, with the embryo at the base of the seed. The fruit is distinct from that of the avocado in having a large, fleshy, bluntly-toothed calyx, pinkish or whitish in color, which remains on the tree when the fruit falls. This species is introduced in connection with the experiments now being carried on with a view to determining the best stock on which to bud the avocado." (Popenoe.)

Persea sp. (Lauraceae.) 44999. **Coyo** budsticks from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 161. From the sitio of Don David Pierri, San Cristobal, Verapaz. July 3, 1917.) The **coyo, chucte, shucte,** or, as it is sometimes called, **chaucte,** is a species of Persea which is undoubtedly indigenous in this region. It is reported also from Zacapa and Chiquimula, but I have only seen it here up to the present. The tree grows on the banks of streams, where the soil is moist and rich. The hills in this region are dry, rocky, and covered with a scanty vegetation of cacti, Pereskia, thorny leguminous shrubs and small trees, and a few other plants. As well as being indigenous to this region, the **coyo** must be classed as a cultivated fruit tree, since it is occasionally, but not often, planted in gardens. At the present time the **coyo** is neither in flower nor in fruit. It is said to bloom in February and to ripen its fruit in May and June, continuing until August. One of the two trees which I have seen, (this one standing on the north bank of the Rio Motagua a short distance above El

Rancho) was about 60 feet in height. The other one was not more than 45 feet high. The general appearance of the tree, its habit of growth, size, character of bark and foliage, are remarkablly suggestive of an avocado of the West Indian type; but on closer examination it is seen that the leaves are larger than is common with the avocado, the venation is impressed on the upper surface of the leaf, and, most conspicuous of all, the ends of the young branchlets and the petioles are covered with a ferrugineous tomentum. The foliage is said to fall just before the tree comes into bloom: the flowers making their appearance with the new leaves. The leaves are clustered at the ends of the branchlets, though not crowded. The leaf-blades are oblong-elliptic, truncate at the base, sharply acute to shortly acuminate at the apex, 8 to 12 inches long, 4 to 7 inches broad, bright green and glabrous above, glaucous and rather heavily pubescent below; the pubescence ferrugineous on the midrib and to a less degree on some of the larger transverse veins. The venation is slightly impressed on the upper surface, very prominent below. The petioles are 1 to 1¾ inches long, narrowly canaliculate toward the articulation with the leaf-blade, and ferrugineous-pubescent like the branchlets from which they arise. The fruit is described as long and slender, almost black, with a large and long seed and thin flesh. The flavor is described as rich and bland, similar, but superior, to that of the avocado. It is highly esteemed by the inhabitants, and it is stated that it has even been shipped to the city of Guatemala and sold in the market there." (Quoted from description furnished with Popenoe's No. 72.)

Rymandra excelsa Salisbury. (Proteaceae.) 44956. Seeds from Auckland, New Zealand. Presented by Mr. H. R. Wright, Avondale Nursery. A New Zealand tree, sometimes 100 feet in height, with stiff, linear-oblong, roughly-toothed leaves 4 to 8 inches long, and racemes of red, velvety flowers, 2 to 3 inches long and 2 inches in diameter. The tree bears a considerable resemblance to the Lombardy poplar when seen from a distance. The wood is much used for cabinet work. (Adapted from Laing and Blackwell, Plants of New Zealand, pp. 146-148, under *Knightia excelsa.*)

Solanum tuberosum L. (Solanaceae.) 45023. **Potato** tubers from Honolulu, Hawaii. Presented by Mr. J. M.

Westgate, Agronomist in Charge, Hawaii Agricultural Experiment Station. "**Portuguese Red.** These were submitted by Mr. J. B. Thompson, Superintendent of the Glenwood Experiment Station, Hawaii. They are important because they are remarkably immune to the diseases (late blight wilt, etc.) which affect the ordinary potato." (Westgate.)

Tabebuia pentaphylla L. Hemsley. (Bignoniaceae.) 44998. Seeds from Guatemala. Collected by Mr. Wilson Popenoe, of this Bureau. "(No. 154a. July 9, 1917.) **Matiliscuate.** A handsome flowering tree, found in north central Guatemala, especially in the valley of Salamá, commonly growing near small streams. I have seen it at elevations of 2000 to 3500 feet. The tree is about 35 feet high at maturity, with a spreading crown, deciduous during the latter part of the dry season (January to March), and producing large clusters of pink flowers which make it a mass of color visible for some distance. Its flowering season is from January to March, and the seeds, which are produced in long, slender pods, ripen in May and June. As an ornamental tree for cultivation in south Florida, and possibly also in California, the **matiliscuate** seems well worthy of trial. Its only defect is its habit of dropping its leaves during the dry months of the year. However, if it flowers in the same months in Florida as it does in Guatemala it should be a valuable addition to the flowering trees of that region. It thrives on heavy but rocky land, and does not seem to require a large amount of water." (Popenoe.)

Zea mays L. (Poaceae.) 45036. **Corn** seeds from Port-au-Prince, Haiti. Presented by Captain John Marston, Civil Administrator. "Selected maize. A prolific bearer throughout Haiti; in the mountains, along the beach, and in the valleys and lowlands." (Marston.)

Ziziphus mauritiana Lamarck. (Rhamnaceae.) 44940. **Indian jujube** seeds from Saharanpur, India. Presented Mr. A. C. Hartless, Superintendent, Botanic Garden. "The tree is mainly cultivated for its fruit, which on the wild or commoner kinds is more or less globose, and on the cultivated and improved kinds, ovoid or oblong. The pulp is mealy and sweetish, with a pleasant taste, and some of the cultivated kinds are very good indeed. The dried fruits are sold in the bazaars of

the Panjab under the name of **unab;** the best kind is imported from Kandahar." (D. Brandis, Forest Flora of India, p. 88, under *Z. jujuba* Lan.)

Notes on Behavior of Previous Introductions.

Mr. Joseph L. Delafield, 35 Nassau St., New York, in a letter dated November 19, 1917, states regarding the Tashkand watermelon (S. P. I. No. 29243), of which he has a number of seeds, that in his opinion it is valuable to market gardeners, as it will keep well in shipment and bear considerable rough handling without injury. In a letter, dated Oct. 29, Mr. Delafield states that he found the Tashkand watermelon of superior quality, the vine being strong and bearing fair-sized fruits filled solid.

A letter from the Tribble Nursery Co., Elk Grove, Cal., dated December 10, 1917, concerning various introductions which they have tested, reports on several as follows:

"21989. **Fei tao seedling peach,** four trees. Each tree bore identically the same fruit. Fruit averaged 1 pound each. Tree good grower and shows that it will bear heavily. This is the finest white peach we have ever seen. It is far superior to the White Heath Cling and much larger. We use this nearly exclusively for home canning. Ripens early August; blooms full March 1st. 31652. **Methly plum.** One of the most valuable introductions we have tried. Ripens very early, blooms with Japanese types of plums and needs to be thinned 10 and 15 to 1 when it is as large as an average Wickson. **Quetta Nectarine.** One of the finest nectarines we have seen, and the most fragrant. Very large. Red over greenish white ground, sweet and delicious. Cling stone. Ripens in August, shy in bearing so far, and very susceptible to curl leaf. **Early Chinese cherry.** Small fruit very good; light pink. Blooms in early February, often ripens last of March and never later than middle of April. Bears very good crop and tree seems perfectly free from any gum disease. **Chinese pears.** A number of these bore fruit of no particular value. No blight in trees, while other varieties blighted badly, as well as did many varieties of apples."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, R. N. Jones, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

RECEIVED
1917
University of California

PLANT IMMIGRANTS.

No. 136. AUGUST, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	S.P.I.No.	Page		S.P.I.No.	Page
Annona	(45077)	1213	Melicocca	(45047)	1214
Berberis	(45096)	1213	Persea	(45078)	1214
Cocos	(45045)	1213	Prunus	(45049 to 45064)	1215 to 1219
Dovyalis	(45048)	1213			
Eugenia	(45068)	1214	Pyrus	(45046)	1220
Gnetum	(45152)	1214	Trichilia	(45069)	1220
Malus	(43174)	1221	Triticum	(45145)	1221

Plates:

Pl. 223. A Chinese Elm, Centuries Old, *Ulmus pumila.*
224. Fruit of the Patashte, a Relative of the Cacao, *Tribroma bicolor.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

July 17, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Annona cherimola Miller. (Annonaceae.) 45077. **Cherimoya.** From Jujuy, Argentina. Presented by Mr. S. W. Damon, Orán. Reported to be frost-resistant, having withstood 9 or 10° C. (16 or 18° F.) of frost. Said to be a fine anona, weighing up to two kilos (4 2/5 lbs.).

Berberis trifoliolata Moricand. (Berberidaceae.) 45096. **Barberry** plants grown at the Chico Field Station from seeds originally received from Dr. David Griffiths, collected in Texas. Evergreen shrub, 2 to 5 feet in height, often forming large thickets. The compound leaves have 3 leaflets, each 3 to 5-lobed, with spiny margins. The red, aromatic berries, about as large as peas, are very acid and are much used for tarts, jellies, etc. (Adapted from Small, Flora of the Southern United States.)

Cocos eriospatha Martius. (Phoenicaceae.) 45045. **Palm** fruits from Gotha, Florida. Presented by Mr. H. Nehrling. "A most beautiful, glaucous, pinnate-leaved palm with slightly violet-colored leaf stems. The seeds were received under the name of *Cocos blumenavia* from Blumenau, in Brazil, in 1892. This palm bore its first bunches of fruit four years ago. The large, cream-colored flower cluster is enclosed in a spathe densely covered with a felty, brown, soft wool. The fruits have no odor. They are the size of a very large cherry or small plum, are yellow, and are covered with deep brown spots. The fruit is the most delicious of all the hardy *Cocos*, and reminds one of the flavor of a very good sweet plum. The palm grows on high dry pine-land and is hardier than the orange." (Nehrling.)

Dovyalis tristis (Sond.) Warburg. (Flacourtiaceae.) 45048. Seeds from Pretoria, Transvaal, South Africa. Presented by Mr. I. B. Pole Evans, Chief, Division of Botany, Department of Agriculture, Union of South Africa. "A tree which occurs on the kopjes (low hills) around Pretoria and which bears an abundance of small fruits. These fruits make a delicious jelly." (Evans.) Usually an armed shrub or small tree 10 to 15 feet high, with leathery, obovate, glabrous leaves, shiny above. The inconspicuous flowers appear in November, followed in January by the roundish, yellow, pulpy fruits which are about ½ inch long. The fruits are highly flavored, and are eaten raw or made into

jelly, although the tree is never cultivated. (Adapted from T. R. Sim, Forests and Forest Flora of Cape Colony, p. 130.)

Eugenia uniflora L. (Myrtaceae.) 45068. Seeds from Puerto Bertoni, Paraguay. Presented by Dr. Moises S. Bertoni. "(June 1917.) **Anangapirih.** A fruit tree 3 to 8 meters high. It prefers to grow in wooded lowlands, drained by arroyo basins, or on rocky slopes; in such situations the little trees become tall, with few branches and short twigs. In open places and in good soil it becomes less tall and more branched. The fruit is quite similar in appearance and taste to the **patanga** of Brazil, but the tree is more resistant to cold, for it grows in localities where the minimum temperature reaches 5° or 6° C. (9° or 11° F.)." (Bertoni.)

Gnetum gnemon L. (Gnetaceae.) 45152. Seeds from Buitenzorg, Java. Presented by the Director, Botanic Garden. An evergreen shrub or small tree extending from the Khasia Hills of India southwards to Singapore and Java. The sessile orange-colored fruits are about 1 inch long, and are eaten by the natives. The leaves are eaten boiled like spinach, and the bark is said to furnish a strong bast fiber. (Adapted from Koorders and Valeton, Boomsoorten op Java.)

Melicocca bijuga L. (Sapindaceae.) 45047. **Mamon** seeds from Caracas, Venezuela. Presented by Mr. Henry Pittier, Agricultural Experiment Station. "A small or middle-sized tree with thick foliage. The round or oval fruits are about the size of a pigeon's egg, and are borne in racemes hanging from the ends of the branchlets. Each fruit has a single seed, with a layer of sweet, jelly-like pulp between the seed and the green pericarp. The roasted seeds are said to be of a fine flavor. The tree grows from sea-level to 1200 meters (3900 feet), and should thrive in Florida and southern California." (Pittier.)

Persea americana Miller. (Lauraceae.) 45078. **Avocado** budsticks from Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "No. 171. Avocado No. 31. **Nimah** from Mazatenango, Department of Suchitepequez. Elevation 1148 feet. A variety obtained especially for trial in Florida, since it comes from the hot lowlands and may be better adapted to the conditions which obtain in extreme

south Florida than are those from the Guatemalan highlands. The fruit is pear-shaped, sometimes curved, with a well defined neck. It is of medium size, weighing about 11 or 12 ounces, deep green in color, with a rough surface and a thick, tough skin. The flesh is deep yellow in color, free from fiber and of rich flavor. The seed is medium-sized. On the whole the variety is satisfactory in point of flavor and quality, yet it is not good enough to be included in my Guatemalan collection on these characteristics alone." (Popenoe.)

Persea americana Miller. (Lauraceae.) 45083. **Avocado** seeds from Bogota, Colombia. Presented by Sr. Alvaro Uribe. "One of the best Colombian avocados. It grows at elevations of from 3000 to 4500 feet, at temperatures ranging from 20° to 26° C., (36° to 47° F.) and ripens in April. The fruits are well-shaped, and excellent in taste. The trees are very robust, and require only sufficient moisture in the air." (Uribe.)

Persea sp. (Lauraceae.) 45081. Seeds from Guatemala. Obtained by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 170a. July 23, 1917.) **Coyo** or **shucte.** Seeds of a very large variety of **coyo** from the town of El Rancho, in eastern Guatemala. The fruits from which these seeds were taken weighed from one to two pounds each. They were bright green in color, with very thick skins, and milky white to brownish white flesh of very rich, nutty flavor. They contain a little fiber, but not as much as is commonly found in the **coyo.** These seeds should be planted in California and Florida and fruited as seedlings." (Popenoe.)

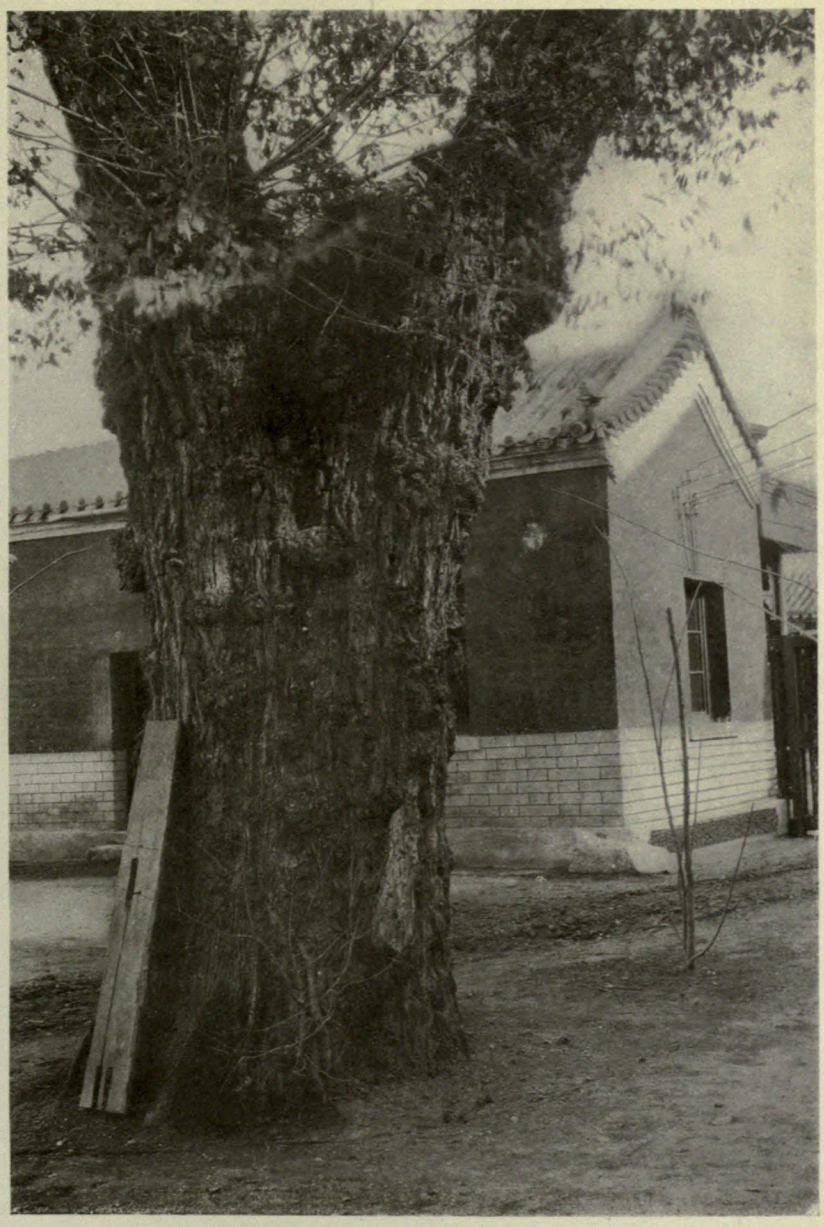
Prunus mume Sieb. & Zucc. (Amygdalaceae.) 45063. **Japanese apricot** plants grown at the Plant Introduction Field Station, Chico, California, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Tsukasa-shibori.** Semi-double very light pink-flowered variety blooming in Maryland the middle of April. Though spoken of as the 'Flowering Plum of Japan' the *mume* of Japan is really an apricot. The delicate fragrance of the flowers, the extreme picturesque habit of its growth and its extreme earliness (April in Maryland) make it worthy of extensive trial. Its fruits rarely set in America. They are sour but when pickled form a delicious though very sour pickle." (Fairchild.)

Prunus mume Sieb. & Succ. (Amygdalaceae.) 45064. **Japanese apricot** plants grown at the Plant Introduction Field Station, Chico, California, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Oteno.** The 'Japanese Flowering Plum' is really an apricot. The picturesque form of the tree, its extremely fragrant blossoms and their beauty combined with the fact that it is one of the earliest of all trees to bloom, often so early that snow falls on the blooms, have made it the favorite of Japanese poets. It is hardy in the Atlantic coast states and even though its blossoms often get killed by frost it is worthy of extensive trial. Its fruits are sour and remind one of the American wild plum in flavor. They form, when pickled, an important part of the Japanese army ration." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45049. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Naden** (?). One of the loveliest of the very double, delicate pink varieties. Late flowering, about May 1. Flowers hang in clusters of 2 to 5 on long stems; buds at first deep pink and truncate as though their tips had been cut off. Expand slowly and form wonderful double very large (1½ inches) flat flowers with petals a delicate pink, deeper colored at the margins. Flowers in rifts. Tree extremely Japanesque. Fairly vigorous. One of the loveliest for small lawn planting." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45050. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Hosokawa.** A very beautiful double-flowered form with truncate, deep pink buds and flat, light pink flowers in clusters of 2 to 3 on rather long pendent flower-stalks. Flowers very profusely. Resembles closely the **Naden** (S. P. I. 45049) but tree appears to be less vigorous. Late bloomer (May 1 in Maryland)." (Fairchild.)

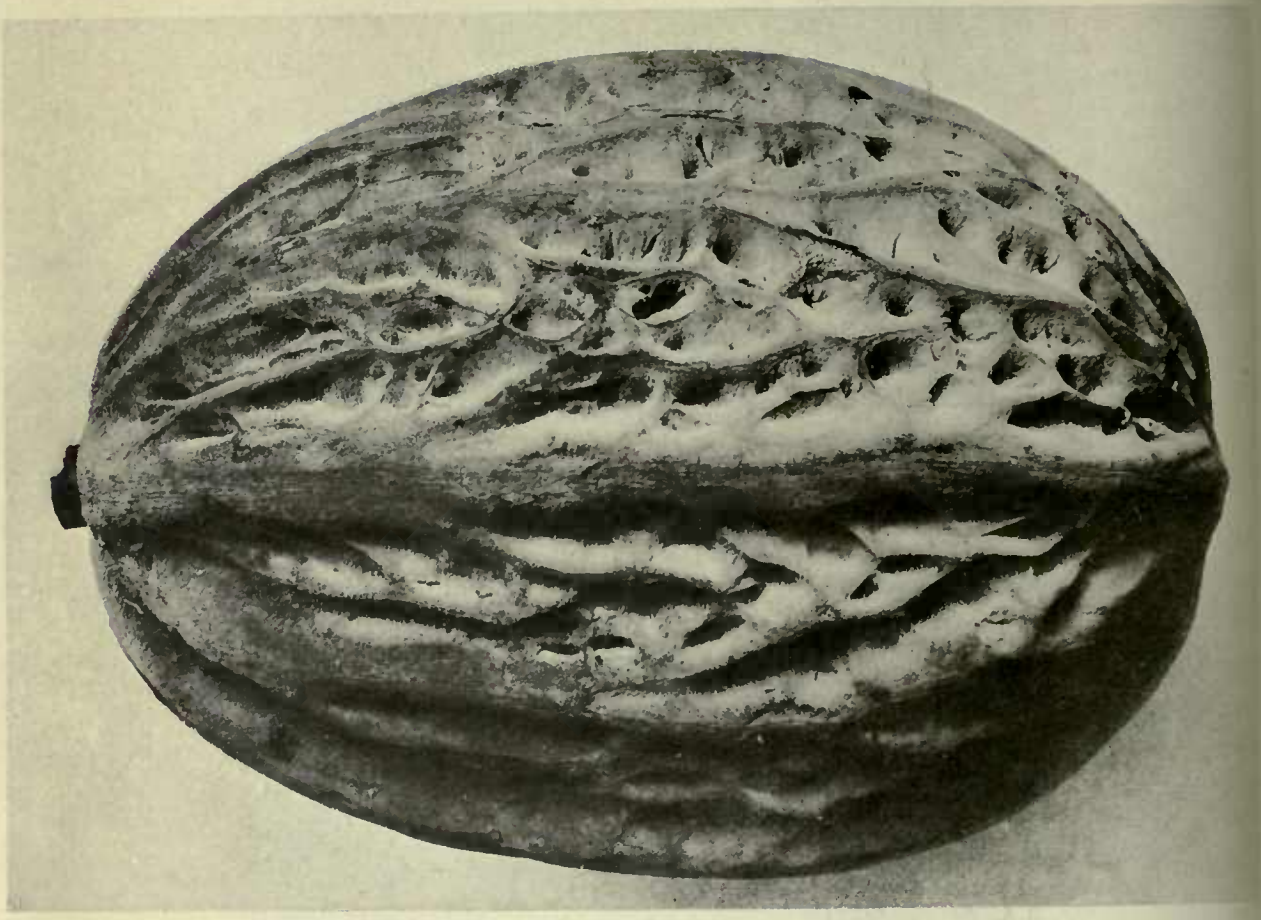
Prunus serrulata Lindley. (Amygdalaceae.) 45051. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In



A CHINESE ELM, CENTURIES OLD.

(*ULMUS PUMILA* L.)

The unusual adaptation to widely varying conditions of growth exhibited by this introduced species, which is now growing in hundreds of places in America—from Canada to the Gulf States—makes this illustration of a tree, which is said to be 300 years old and is still growing in the Central Park in Peking, of unusual interest to American tree lovers. (Photographed by Frank N. Meyer, November 9, 1916, at Peking, China; P12375FS.)



FRUIT OF THE PATASHTE, A RELATIVE OF THE CACAO.

(*TRIBROMA BICOLOR* (HUMB. AND BONP.) COOK.)

According to Mr. O. F. Cook, this gourdlike elliptical pod contains large fleshy seeds which are used in the same manner as cacao among the Indians of Guatemala. Though not considered the equal of cacao in quality, the patashte is bought readily by the Indians and would undoubtedly find a place in commerce if it could be produced cheaply. The patashte tree grows much more rapidly than cacao, develops into a much larger tree, and has been used experimentally as a shade tree for cacao. Its rapid growth and adaptation to high altitudes make it promising for trial as a stock for the cacao. (Photographed by Wilson Popenoe, at Escuintla, Guatemala, September 22, 1916; P16793FS.) Slightly under natural size.

the Woods". "Var. **Ojochin.** Flowers very slightly double, large (1½ inches), almost pure white on short upright stems; slightly fragrant; late flowering (May in Maryland). Though the flowers are not borne in masses and the tree is not therefore as showy as that of other varieties the unusual size and beauty of the individual flowers, resembling single roses, make it attractive for door yards. Foliage bronze and golden in autumn. Tree not very vigorous." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45052. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Daizen.** Single white medium-sized flowers (1 inch) with distinct cherry fragrance. Midseason (April 20 to May 1 in Maryland). The flowers are scattered most attractively through the tree but the green leaves come out early mixing with them and preventing the tree from being very striking. Not one of the showy varieties but an unusually vigorous grower and produces many seeds. Foliage in autumn golden yellow." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45054. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Amenogawa.** Translated meaning Milky way. One of the most striking varieties because of its upright or fastigiate growth. Peculiarly suited for architectural uses. Medium-sized white to very light pink flowers on short stems borne in great masses concealing the branches. Seen from below suggests characteristic name. Tree not very vigorous." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45055. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Ussussumi.** Very late variety, May 1, with hanging, large, very double flowers borne in clusters. Petals are tinged with light brown giving them a strange not unattractive appearance. The young leaves borne at same time as the flowers are dark bronze. In autumn the foliage turns a claret red. Tree a fairly rapid grower but the trunk inclined to be tender. Flowers very profusely." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45056. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Murasaki.** Deep pink semi-double flowers (1 inch) on short upright stems; very free flowering. While perhaps not quite so delicate as some of the very double, light pink varieties this makes a striking show from a distance and for park use can be highly recommended. Tree low heading, vigorous, flowering in mid-season, (April 20 to May 1 in Maryland). Foliage when young an orange color, in autumn turns a golden yellow." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45057. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Choshu.** Very large, deep pink, double flowers (1½ inches) borne on long pendant stems in clusters of 2 to 5. Flower buds very deep pink. Late flowering (May 1 in Maryland). Young foliage beautiful bronze; in autumn gold and crimson. Tree not very vigorous nor free-flowering." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45058. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Undetermined variety. Single white flowers borne very profusely in short upright clusters medium size (1 inch across), not fragrant. Mid-season (April 10 to 20). Tree a vigorous grower; very Japanesque. Trunk not easily diseased. On fairly fertile soil forms a tree 20 feet tall in 10 years. (Named, evidently incorrectly, **Jo Beni**)." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45059. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Asagi.** A rare variety with pale green flowers which have, when they first open, a strange but very attractive appearance; later the centers of the flowers turn red and they are then less attractive. Not showy at a distance, but delicately beautiful for use in house decoration." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45060. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Wasemiyako.** Large semi-double almost pure white flowers, upright on short stems, very attractively arranged on the branches. Mid-season; (flowering April 25 in Maryland). Tree only fairly vigorous. Suitable for lawn planting and showy from a distance." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45061. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Miyakobeni.** Mid-season variety (April 10 to 20 in Maryland), with semi-double flowers (1¼ inches across) borne on short upright stems in clusters of 2 or 3. Buds pointed, quite pink; flowers pale pink when young, turning reddish with age, slightly fragrant. The tree is a very profuse bloomer and vigorous grower, attaining 20 feet in 10 years on Maryland mica schist soil." (Fairchild.)

Prunus serrulata Lindley. (Amygdalaceae.) 45062. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Toranowo.** Large (1½ inches) extremely double flowers, deep pink when in bud becoming delicate light pink in full bloom, hanging on long stems in clusters of 2 to 5. Buds flat as though tips were cut off. Not so free-flowering as **Naden** (S. P. I. No. 45049) but with deeper pink flowers. Prominent green pistils. Tree fairly vigorous." (Fairchild.)

Prunus sieboldii (Carr.) Wittmack. (Amygdalaceae.) 45053. **Japanese flowering cherry** plants grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Var. **Mikuruma gayeshi.** Early flowering (April 10 to 20 in Maryland), quite light pink, semi-double, medium-large flowers on long upright stems. Very profuse bloomer. Tree vigorous and because of earliness of flowering a very desirable variety though individual flowers are perhaps not so lovely as the very double late-blooming sorts." (Fairchild.)

Pyrus ussuriensis Maximowicz. (Malaceae.) 45046. **Pear.** From Charles City, Iowa. Presented by Mr. Charles G. Patten. The origin of these cuttings is given in the following account: "In the reports of the Iowa Horticultural Society for 1906 and 1912, Mr. Charles G. Patten called attention to a **Chinese Sand Pear** which he has used in some of his breeding work. He states that in 1880 Mr. O. A. Bardhall, of Grundy Center, Iowa, purchased a tree of the **Chinese Sand Pear** from John S. Collins & Sons, of New Jersey, which they represented would bear fruit nearly as large as the **Flemish Beauty.** When it came into bearing the fruit proved small, hard and worthless. Mr. Patten propagated a tree from this because it had proved its great hardiness during the severe Iowa winter of 1883-84. Mr. Patten states that his tree at Charles City, Iowa, has never been injured in the least by cold and has never blighted since it was planted in 1885. Since *Pyrus ussuriensis* has proved so remarkably resistant to blight in our work, and as it is the hardiest species of pear known, I thought that possibly Mr. Patten's tree belonged to this species. In reply to a letter Mr. Patten kindly sent me leaves of his tree which I received on November 10 of this year. As the tree had not borne this year, no fruit was sent, but Mr. Patten kindly furnished a description of the fruit and stated that the tree probably belonged to *Pyrus sinensis.* An examination of the leaves, however, shows conclusively that this tree belongs to *Pyrus ussuriensis.* The tree in Iowa is the oldest one of this species in America so far as I have been able to learn. Undoubtedly there are other trees in America just as old or older than the Iowa tree. It is quite probable that Collins & Sons sent out trees of this species other than the one sent to Iowa. I hope that some of these can be located and the writer would be pleased to receive specimen leaves and fruits of any tree which promises to belong to this species." (Reimer, Blight Resistance in Pear Trees and Stocks.)

Trichilia catigua A. Jussieu. (Meliaceae.) 45069. **Katigua** seeds from Puerto Bertoni, Paraguay. Presented by Dr. Moises S. Bertoni. "(June, 1917.) **Katigua.** A small ornamental tree, found throughout the forests of Paraguay. The bark, according to our analyses, contains 20.5 per cent crude tannin, and a large proportion of coloring matter for dyeing. The leather thus tanned is of a red color which is much esteemed." (Bertoni.)

Triticum aestivum L. (Poaceae.) 45145. **Wheat** seeds from Sydney, Australia. Presented by Mr. George Valder, Under Secretary and Director, Department of Agriculture. "**Florence.** It was noticed that during the 1916-1917 season, when a great deal of rust was experienced all over this State, **Florence** proved more rust-resistant than any of the other varieties sent." (Valder.) A very early wheat used for both grain and hay in New South Wales.

Notes from Correspondents Abroad.

Extract from letter dated April 30, 1917, from Mr. H. R. Wright, Avondale, Auckland, New Zealand:

"Amongst the apples I forwarded last season is one called **Willie Sharp**. This apple is a first-class variety for a stock, as it roots very freely. The method of raising them: first, root graft some cuttings; the following season, that is, when they are one year old, cut down to the ground and they will shoot up bushy, and as soon as the shoots get a few inches high start to earth up and they will then root out of the sides. The following winter, pull the moulding down and cut off just below the collar of fibrous roots. These you plant out in nursery rows to grow into trees, or bud other varieties on to them.

This is what we call the stool system, and is fast becoming the recognized method of raising aphis-resisting stocks. Once you get some plants on their own roots you can select some of the strongest roots, cut into pieces about 2½ inches long, then nick out a line about the same depth with a spade and plant about one inch apart, just covering the top of the root and no more. The following season lift and plant out for stools.

When planting out stools, plant about one foot apart, with about four feet between the rows. This will give you plenty of room to use a celery moulder to earth up. It must be borne in mind with the stool system through continually cutting them back to the ground they increase in the number of plants you take off each year. Only aphis-resistant stocks are used both in Australia and New Zealand."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, Miss Bessie M. Broadbent, R. N. Jones, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS.

No. 137. SEPTEMBER, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Amaranthus	1225	Garcinia	1228
Annona	1225	Ipomoea	1228
Brassica	1225, 1226	Litchi	1231
Chloris	1226	Passiflora	1229
Citrus	1231	Prunus	1229, 1230
Cudrania	1227	Psidium	1232
Cyphomandra	1231	Tetrazygia	1230
Durio	1227		

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

August 8, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Amaranthus gangeticus L. (Amaranthaceae.) 45182. **Amaranth.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2385a. Hanchow, China. March 9, 1917.) A green-leaved amaranth, much cultivated in central China as a garden vegetable; and eaten, when young, like spinach. The plant stands any amount of moist heat, and can be sown at intervals throughout the summer. As the seedlings suffer a good deal at times from damping off, the Chinese generally have the beds raised slightly above the surrounding land and then cover the surface with a sifted mixture of soot, ashes, and lime, which acts as a fertilizer as well as a fungicide. Chinese name **Pai han ts'ai,** meaning 'White amaranth vegetable'. This **Han ts'ai** probably can be made a popular hot weather vegetable throughout the southern sections of the United States." (Meyer.)

Annona cherimolia x squamosa (Annonaceae.) 43181. **Hybrid Anona.** Grown at the Plant Introduction Field Station, Miami, Florida, from Garden No. 1803, tree C. A hybrid between the cherimoya and the sugar-apple, produced by Mr. Edward Simmonds of the Miami Field Station. It combines the unusual sweetness of the sugar-apple with the firmness and better shipping quality of the cherimoya. The trees show unusual vigor, having withstood the freeze of February, 1917, (temperature 26° F.) without being much damaged.

Brassica pekinensis (Lour.) Gagn. (Brassicaceae.) 45185. **Pai ts'ai** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2388a. Taianfu, Shantung, China. March 1, 1917.) A heavy, winter chinese cabbage of fine quality, making firm, much elongated heads. Sown out in early August and transplanted in rich, well-worked soil; it must not suffer from lack of water. Can be kept throughout the whole winter when stored in a cool dugout cellar; can also be held in good condition for several months when hung from the rafters of a cool storeroom, or kept in an airy box." (Meyer.)

Brassica pekinensis (Lour.) Gagn. (Brassicaceae.) 45186. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2389a. Hankow, China. June 9, 1917.) A spring and autumn variety of Chinese cabbage of open growth; eaten boiled like kale or mustard sprouts. Sown from

early April to the end of May for spring consumption; for autumn use it is planted from the end of July to the end of August. Chinese name **Ya hao pai ts'ai,** meaning 'Fresh leaf cabbage'." (Meyer.)

Brassica pekinensis (Lour.) Gagn. (Brassicaceae.) 45187. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2390a. Hankow, China. June 9, 1917.) An open headed, very dark green variety of Chinese cabbage, sown out in September; persists throughout the winter in mild climates. Chinese name **Hei pai ts'ai,** meaning 'Black Chinese cabbage.' Probably this should be cultivated as greens for winter in the South Atlantic and Gulf States." (Meyer.)

Brassica pekinensis (Lour.) Gagn. (Brassicaceae.) 45188. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2391a. Hanchow, China. June 9, 1917.) An open-headed variety of Chinese cabbage, sown out in August and used as a fall and winter vegetable. Chinese name **Chiang kan pai ts'ai,** meaning 'Car-shaped pai ts'ai.' This should probably be cultivated as a greens for winter use in the South Atlantic and Gulf States." (Meyer.)

Brassica pekinensis (Lour.) Gagn. (Brassicaceae.) 45189. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2392a. Hanchow, China. June 9, 1917.) A winter variety of **pai ts'ai** with solid heads; sown out in September. Chinese name **Nan ching pai ts'ai,** meaning 'Nanking cabbage.' This should probably be cultivated as a greens for winter in the South Atlantic and Gulf States." (Meyer.)

Chloris breviseta Bentham. (Poaceae.) 45208. **Grass.** From Leverville, Belgian Kongo. Presented by Pere Hyacinthe Vanderyst, Jardin Agrostologique, through Mr. C. V. Piper. "(Jardin Agrostologique, Leverville, July, 1917.)" A West African grass from the Cape Coast region, resembling *C. compressa* in the structure of its flowers. The new growth is said, in Belgian Kongo, to form an excellent pasture for small animals. Rhodes Grass, *C. gayana,* also from western tropical Africa, has succeeded so well in the Southern States, that this grass also, should receive a thorough trial.

Cudrania tricuspidata (Carr.) Bureau. (Moraceae.) 45194. Grown at Yarrow Field Station from seed received from the P. J. Berckmans Company, Augusta, Georgia. A small deciduous tree, with slender, thorny branches, and fleshy subglobose edible fruits. Messrs. Berckmans, in sending in the seed, reported that although the one tree left in their nursery at that time had fruited very well, it was rather difficult to get any amount of fruit at one time, because the laborers seem so fond of it. The fruit is a very attractive color, pink with a delicate bloom on it. There are numerous small seeds and the flesh is soft and melting with a flavor which should be more pronounced to be really satisfactory. It is a relative of the osage orange (*Maclura*) and has been hybridized with it successfully. Its fruits ripen in October and November, and the best flavored seedlings should be selected. There is another species, *C. javanica*, which is tender, but which might be valuable for breeding purposes. This Chinese species is hardy at Washington, D. C. (Fairchild.)

Durio zibethinus Murray. (Bombacaceae.) 45179. **Durian.** From Dominica, British West Indies. Presented by Mr. Joseph Jones, Curator, Botanic Gardens. "I believe Dominica is the only place in the Western tropics in which the Durian tree has fruited. It first bore fruit in this island as far back as 1892." (Jones.) A very large, handsome, pyramid-shaped tree, native of the Malay Archipelago, and commonly cultivated in the Straits Settlements, Burma, Java. etc., for the sake of its celebrated fruit. The latter, produced on the older branches, varies somewhat from round to oval in shape, and usually weighs from 5 to 7 lbs., though sometimes as much as 10 lbs. It is armed with thickly set formidable prickles about one-half inch long; when ripe it becomes slightly yellow, and possesses an odor which is intensely offensive to most people, especially on first acquaintance with it. The cream-colored pulp surrounding the seed is the edible portion; this is most highly prized by the Malays and other Oriental races, and is also relished by the Europeans who acquire a taste for it. The large seeds may be roasted and eaten like chestnuts. Durian fruits are variable in size, shape, flavor, and quantity of pulp, according to variety. The trees also vary in productiveness, some varieties being almost barren. Selection and high cultivation should, therefore, be

practised in order to obtain the best fruit. The tree is readily propagated by seed if sown fresh. The large fleshy seed is of short vitality, and germinates in seven to eight days. (Adapted from Macmillan, Handbook of Tropical Gardening and Planting.)

Garcinia mangostana L. (Clusiaceae.) 45180. **Mangosteen.** From Dominica, British West Indies. Presented by Mr. Joseph Jones, Curator, Botanic Gardens. A moderate-sized conical tree, with large leathery leaves, indigenous to Malaya. Its globular purplish brown fruit, about the size of an apple, is famed as one of the most delicious fruits of the tropics. The delicate white juicy pulp surrounding and adhering to the seed is the part eaten. In striking contrast to it is the dense, thick, reddish rind, containing tannic acid and a dye. The tree is of very slow growth and does not usually come into bearing till about nine or ten years old. The essential conditions for it are a hot, moist climate, and deep, rich well-drained soil. Propagation is usually by seed, but may also be effected by "gootee" or layering. (Adapted from Macmillan, Handbook of Tropical Gardening and Planting.) This office has imported several other species of Garcinia with the object of finding a suitable stock for the mangosteen on which will make the culture of this remarkable tree possible over a wide range of soils. Some of these stocks wintered through the Florida freeze of 1917 when the thermometer went to 26° F. and are now growing satisfactory. (Fairchild.)

Ipomoea reptans (L.) Poiret. (Convolvulaceae.) 45184. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2387a. Wuchang, Hupeh, China. June 15, 1917.) The **Kuan ts'ai,** an annual herb, is cultivated by the Chinese as a hot weather leaf-vegetable, and is prepared and eaten much like spinach. It is usually sown in rows at intervals during the spring and summer to insure a continuous supply of greens. It thrives best in a rather wet heavy soil, and withstands being submerged (even for several days) without injury. The foliage resembles that of the sweet potato a good deal, but the roots are not fleshy. The young shoots are cut at intervals until the plants become exhausted. The white or pale rose-colored flowers appear in July and August, and shortly after flowering the plants set a good supply

of seeds which is harvested for the next season crop. Chinese name **Kuan ts'ai (Wong ts'ai)**, meaning 'Jar vegetable' or 'Bamboo-leaf vegetable'." (Meyer.)

Passiflora sp. (Passifloraceae.) 45226. **Passion fruit.** From Oran, Argentina. Presented by Mr. S. W. Damon. "A yellow-fruited, acid type, which I consider much superior to the purple type." (Damon.)

Prunus conradinae (Amygdalaceae.) 45215. **Cherry.** Grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". "Handsome tree, from western China, up to 40 feet in height, with the trunk 8 to 20 inches in diameter, thin, pale green leaves, and white to deep blush-colored flowers, an inch or less across, which appear early in the spring. It is very similar to Sargent's cherry (*P. serrulata sachalinensis*). Its satisfactory behavior over a wide range of territory would seem to indicate its possible use as a stock. It might prove immune to the gummosis disease, or the crown gall or even the peach tree borer, and deserves an extensive trial." (Fairchild.)

Prunus mume Sieb & Zucc. (Amygdalaceae.) 45176. **Japanese apricot.** Grown at the Plant Introduction Field Station, Chico, California, from scions presented by Mr. David Fairchild, from his place "In the Woods". "Variety **Ginfukurin.** A white-flowered variety of the so-called 'Japanese flowering plum tree'. These are among the most picturesque of all flowering trees; and compose a large part of the illustrations on Japanese screens. Because of their extreme earliness and the fragrance of their blooms, they deserve a place in our gardens. The fruits are sour but they have a delicious wild flavor and aroma about them reminding one of our wild goose plum. When pickled they form, as do olives with us, an important adjunct to a meal. These pickled mumes form a part of the ration of the Japanese army and their use is said to quench thirst effectually. They are extremely sour and their use with meats might become popular in America. The flowers of many varieties are often caught by the frost; but the **Ginfukurin** is rather slow in coming into bloom, and so is more likely to escape." (Fairchild.)

Prunus serrulata sachalinensis (Schmidt) Makino. (Amygdalaceae.) 45178. From Yokohama, Japan. Purchased from the Yokohama Nursery Company. "**Yamazakura** (mountain cherry)." A deciduous tree, 40 to 80 feet in height, with a trunk sometimes 3 feet in diameter, and sharply serrate oval leaves which are often reddish when young. The deep pink flowers, from 1¼ to 1½ inches wide, are produced in short-stalked umbels of two to six flowers. The fruit is a small black cherry, 1/3 inch in diameter. This tree, a native of Japan, is probably the finest timber tree among the true cherries, and is also remarkable for its beautiful flowers, which appear in April. The seeds germinate freely after lying dormant for a year. (Adapted from W. J. Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, pp. 250, 251, under *Prunus sargentii*.) This flowering cherry tree has proven hardy on the Atlantic Seaboard as far north as Massachussetts, and Professor Sargent of the Arnold Arboretum recommends it as one of the most beautiful of all the flowering cherries. (Fairchild.)

Prunus subhirtella pendula (Amygdalaceae.) 45216. **Drooping Cherry of Japan.** Grown at the Plant Introduction Field Station, Rockville, Maryland, from scions presented by Mr. David Fairchild from his place "In the Woods". One of the loveliest of all flowering trees. In Japan, growing to a great age and to large size. In the Kyoto park, stands a historic specimen 3 feet in diameter of trunk, with drooping branches covering a whole square which is reported to be 300 years old. It flowers in Maryland about the same time that it does in Japan i,e. the last week in April, and when in bud, full bloom, or passing out of bloom can not be surpassed by any other tree in loveliness. Its flowers are small, single, borne in pairs or threes and they come out before the leaves. For parks and avenues it may not be so showy when seen from a distance as the double flowering kinds, but as a door yard tree when it can be viewed from near by it cannot be surpassed. Hardy to Massachussets. (Fairchild.)

Tetrazygia bicolor (Miller.) Goen. (Melastomaceae.) 45177. From Homestead, Fla. Presented by Mr. Chas. A. Mosier. A low tree, 20 feet high, remarkable for the white powdery down of the branchlets and the inflorescence. Leaves 3 to 5 inches long, variable in

breadth, entire; flowers large, white, in 5 to 7-flowered cymes. Native of the West Indies. (Adapted from Grisebach, Flora of the West Indian Islands.)

Notes on Behavior of Previous Introductions.

Citrus limonia Osbeck (23028). Mr. Frank J. Hart, of Los Angeles, California, says: "I am sending you a small crate of the fruit of the Chinese lemon, distributed under your S.P.I. No. 23028, in June, 1912. These beautiful little shrubs, about two to two and one-half feet high, of somewhat large spread, are certainly a successful introduction from every point of view. They are beautiful, ornamental, and very prolific bearers. These two little shrubs keep my family almost entirely in lemons,- they using them in preference to any other lemon,- of which I have all the different varieties growing on my place. I am very sorry that they use them up so closely that none of the cured lemons are on hand. If they were, you could then see that the texture of the skin, the color, shape, and size are almost perfect from a lemon man's standpoint. They are hardy too, as they bear and blossom just as well in the colder weather here, as they do in midsummer."

Cyphomandra betacea (36934). **Tree Tomato.** Mr. Geo. B. Shaffer, in letter of January 23, 1918, reports: "Just a word concerning the Tree Tomato sent me from the Chico Station in February, 1915. In the fall of 1916, this matured 15 fruits. The plant was slightly injured by frost in December, 1916, but recovered, and has just matured 21 fruits. From seed of the first crop, I have raised 20 vigorous plants, each now two feet in height. I shall continue to grow and propagate these plants, with a view of acclimating them with the hope of ultimately making them a commercial product. Preserved in honey, they are certainly an ideal condiment." *Litchi chinensis* (40973). "I am particularly interested in the development of one of the litchi, received from Yarrow last February. These trees were set out in the orchard, with thin muslin protection over head and on three sides, the west side being left open. Two died, but the third has made a growth of a foot, and is a beautiful plant. These trees were given frequent waterings." (Geo. B. Shaffer, Los Angeles, California. January 23, 1918.)

Psidium guajava L. (34418). **Guava.** Mr. H. H. Kolb, of Petersburg, Florida, reports: "The 3 guava plants sent me in 1904, were planted on what is commonly called flat land, of a good sandy loam. They made the most unusual growth of anything I have ever planted. They were given a small quantity of corn fertilizer about every three months, and were carefully watered whenever necessary. Two of these plants bloomed in May, 1915; the largest one had about 17 fruits, and the other about 6. The third one failed to bloom. Every one who tasted the fruit, pronounced it the finest they had ever known. The meat is a light pink, very thick, and the seed cavity is small. The fruit is pear-shaped and of very good size. Altogether it is without a doubt the finest guava ever grown. Of course these plants were given extraordinary care, but the result has been just as good."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, Miss Bessie M. Broadbent, L. G. Hoover, R. N. Jones, P. G. Russell, and G. P. Van Eseltine, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS.

No. 138. OCTOBER, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Actinidia	1237	Lilium	1240
Berberis	1237	Oryza	1241
Brassica	1237	Phaseolus	1241
Claucena	1238	Pisum	1242
Corylus	1238	Pittosporum	1242
Cudrania	1238	Prunus	1244
Ficus	1239	Rubus	1242
Hibiscadelphus	1239, 1240	Soja	1243
		Vaccinium	1243
Hordeum	1240	Vicia	1244
Lawsonia	1240	Vigna	1244

Plates:

Pl. 225. Cold Resistance of a Hybrid Anona, *Annona squamosa* on *Annona cherimola*.

226. A White Sapote Tree in Guatemala, *Casimiroa edulis*.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

October 1, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Actinidia arguta (Dilleniaceae), 45241. From Bronx Park, New York. Presented by Mr. George V. Nash, New York Botanical Garden. Cuttings from plants sent the New York Botanical Garden in 1898, under S. P. I. No. 235. as *A. polygama.* Introduced from Russia by N. E. Hansen. There is no finer climbing shrub for porches in this latitude than *Actinidia arguta.* Its foliage, which is of a beautiful dark green color with reddish midribs, seems to be practically free from diseases. It is a very vigorous grower and will cover a trellis 20 feet long and 10 feet high in two or three years. The vine, at least in Maryland, does not flower freely until 6 or 8 years old and very few fruits set even when the bloom is abundant. The flowers are attractive, with thin white petals and dark-colored stamens, and have a faint fragrance. The flavor of the fruits is very sweet and pleasant, reminding one of figs. They are about the size of damson plums, have very thin skins, and are filled with extremely small seeds. The selection of good fruiting strains of Actinidia would be a most interesting piece of work. (Adapted from an article by Mr. David Fairchild, in Miscellaneous Papers, Circ. No. 110, Dept. of Agriculture.)

Berberis wilsonae x aggregata (Berberidaceae), 45477. **Hybrid barberry.** From Bell, Maryland. Presented by Dr. W. Van Fleet, of this Bureau. "Hybrids of *Berberis wilsonae* and *B. aggregata* grown from seeds secured by pollination under glass in May, 1914. Both species are late bloomers when grown outside. *B. aggregata*, the pollen parent, is an upright grower with larger foliage than *B. wilsonae* and very showy flower clusters. The hybrids, however, are even more spreading in growth than *B. wilsonae* with very thickset foliage that turns deep purple at the approach of frost and holds on until midwinter. All the hybrids are quite uniform in appearance and are very handsome and hardy. Flowers and fruits have not yet appeared on these seedlings." (Van Fleet.)

Brassica pekinensis (Brassicaceae), 45252. **Pai ts'ai.** From China. Presented by Dr. Yamei Kin, Peking, China. "**Yu ts'ai.** Light variety, from Yuyao, Chekiang, China." (Kin.) "Said to be a very rapid grower, coming to maturity in four weeks, or at most not more than six weeks, from the time of germination. It is especially prized for its sweet 'buttery' flavor which I have

heard characterized of certain varieties of lettuce. It is not eaten raw or for salad purposes: but when dropped into boiling hot water after being cut up in fairly large pieces it makes a staple green vegetable. The rapid growth struck me as being valuable, for if in the same time as is necessary for growing lettuce, one can obtain a good green cabbage, it will be undoubtedly as popular here as it is in China." (Kin. Letter 2-26-18.)

Clausena lansium (Rutaceae), 45328. **Wampi.** From Yeungkong, Canton, Kwang Tung, China. Presented by W. H. Dobson, M.D., The Forman Memorial Hospital. A low spineless tree with spreading branches; pinnate, spirally arranged evergreen leaves; and 4 to 5-parted, small, white flowers in large terminal panicles. Fruit ovate-globose about 1 inch long; skin glandular, pubescent; seeds green. The wampi is a native of S. China where it is commonly grown for its fruits. It is cultivated to some extent in Hawaii and could probably be grown in the warmer parts of Florida and California. It can be grafted on grapefruit and other species of Citrus, which makes it desirable to test it as a stock for common citrous fruits. (Adapted from W. T. Swingle, Bailey's Standard Cyclopedia of Horticulture, vol. 2, p. 786.) "Seeds from the largest **Wong pi** I have ever seen. The **Wong pi** is a grapelike fruit with large green seeds and evergreen leaves." (Dobson.)

Corylus colurna (Betulaceae), 45347. **Turkish hazelnut.** From Rochester, New York. Presented by Mr. John Dunbar, Assistant Superintendent of Parks, through Mr. C. A. Reed, of this Bureau. "The plants from which these nuts were obtained came from L. Spath, Berlin, Germany, twenty-five years ago. They began to bear fruit about six years ago. The trees are now about twenty-five feet tall. It took these nuts two years to germinate." (Dunbar.) The tree is well worth growing for its stately form, so remarkable for a hazel, and for its curiously enveloped nuts. Native of southeastern Europe and Asia Minor; introduced into England about the middle of the seventeenth century. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 402.)

Cudrania tricuspidata (Moraceae), 45448. From Augusta, Georgia. Presented by P. J. Berckmans Company. "This

tree is very easily propagated from suckers. The tree that we have in our nursery is about 12 feet high and about 6 feet broad. It would have been considerably larger than this but for the fact that some four years ago we headed it back to about 3½ feet from the ground. This tree had at least 1½ bushels of fruit which matured from the middle of August up to November. It is most prolific, the fruits on this one tree running up into the thousands." (Berckmans.) The fruit much resembles a dense cluster of very large red raspberries of the *strigosus* type in appearance, and when fully ripe has much the flavor of an over-ripe red raspberry. It has possibilities for jelly making. The numerous seeds are large, but as considerable variation has been noted in their size, selection may ultimately reduce them sufficiently to make the fruit a popular one.

Ficus palmata x carica (Moraceae), 45235. Fig. From Algiers, Algeria. Presented by Dr. L. Trabut. "Seeds of *Ficus palmata,* fertilized by *Ficus carica. Ficus palmata,* originally from Abyssinia and Erythrea appears interesting, first, as one of the probable ancestors of *Ficus carica;* second, the male plants are excellent caprifigs to supply the blastophaga. The autumn figs (*Mammoni*) now have the male flowers and at this moment it is still possible for the blastophaga to carry the pollen. The female plants yield mediocre edible fruits. The hybrids should be interesting for desert regions." (Trabut.)

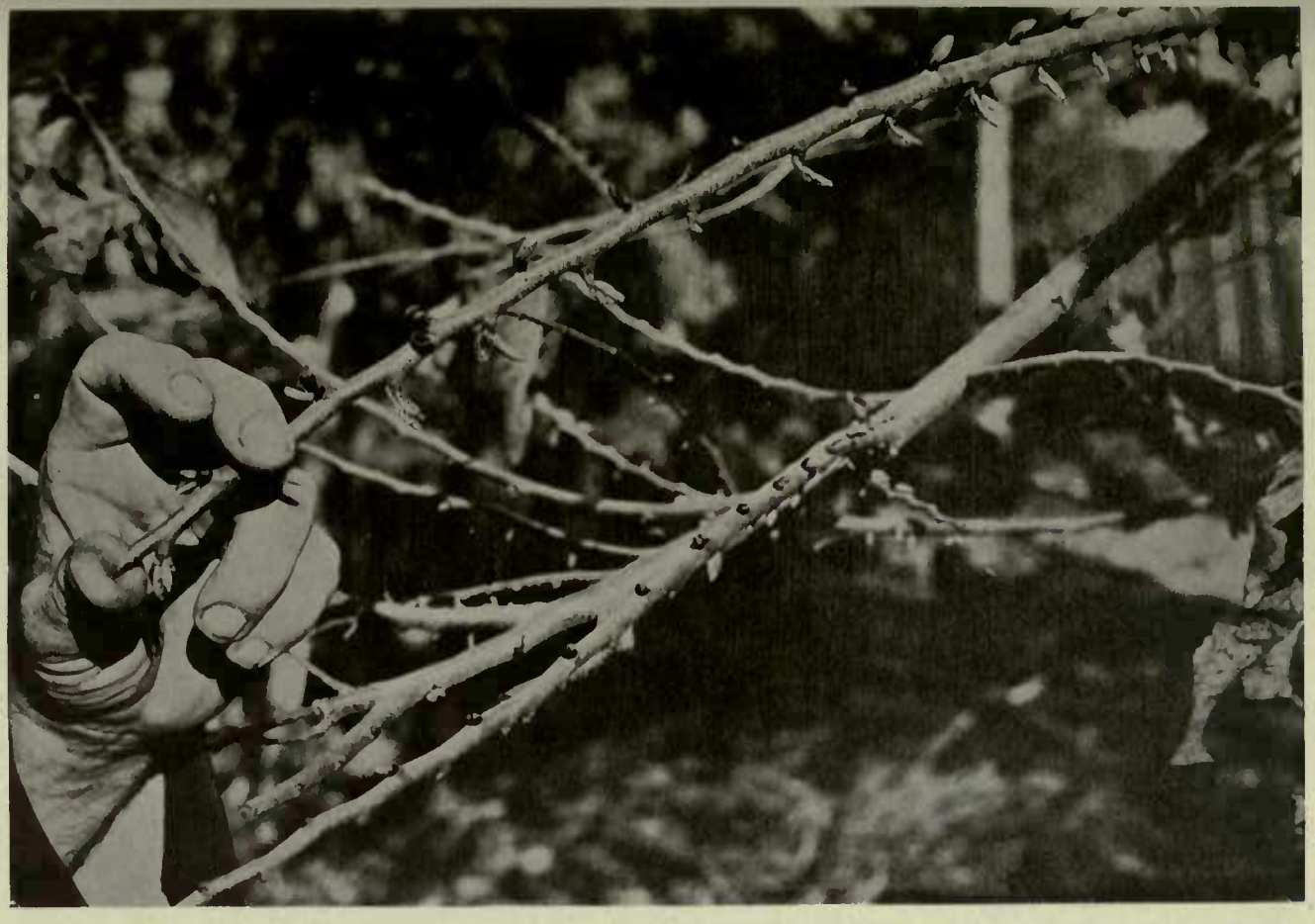
Hibiscadalphus giffardianus (Malvaceae), 45242. From Honolulu, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. "The *Hau kuahiwi* is a remarkable tree. At first appearance one would take it to be the common *Hau* (*Hibiscus tiliaceus*), but at closer inspection one cannot but wonder at the most peculiar shape of the flowers, which are of a deep magenta, and the large yellow tuberculate capsules. It is a rather low tree with not erect but rather inclining trunk of a foot in diameter, with a many-branched round crown. It differs from the genus Hibiscus in its very peculiar flowers (which are curved and convoluted) and mainly in the calyx, which is not persistent with the capsules, but drops, together with the bracts, as soon as the capsules are formed." (Rock, Indigenous Trees of the Hawaiian Islands, p. 299.)

Hibiscadelphus hualalaiensis (Malvaceae), 45243. From Honolulu, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. A tree, 16 to 23 feet high, with erect trunk, white bark, somewhat reniform leaves, and small ovate capsules, belonging to the almost extinct genus, *Hibiscadelphus,* of the three species, of which two are represented by a single tree each, and the present one by a dozen or so living trees. Seeds of all the species are growing, however, in various Hawaiian gardens. This exceedingly interesting and distinct species was found by the writer in the year 1909 on the lava fields of Mt. Haulalai, in North Kona, Hawaii, and in the forest of Waihou of the same district, where about a dozen trees are still in existence. The writer revisited the above locality in March, 1912, and found the trees in flower, while on his previous visit, June 18, 1909, only a few worm-eaten capsules could be found. The trees are badly attacked by several species of moths which feed on the leaves and mature capsules. Mr. Gerrit Wilder, however, succeeded in growing a few plants from healthy seeds collected by the writer. (Adapted from Rock's Indigenous Trees of the Hawaiian Islands, p. 301.)

Hordeum vulgare cornutum (Poaceae), 45366. **Barley.** From Pretoria, Transvaal, Union of South Africa. Presented by Mr. I. B. Pole Evans, Chief, Division of Botany, Department of Agriculture. No. 18. A rust-resistant barley from Fauresmith, one of the important wheat-growing areas in the Orange Free State.

Lawsonia inermis (Lythraceae), 45250. **Henna.** From Kerman, Persia. Presented by J. N. Merrill, Captain, Commanding First Regiment of Cavalry, Persian Army. A handsome shrub, probably native of northern Africa, western and southern Asia, but widely cultivated in tropical countries. The flowers are white, pink, or cinnabar red, and are very fragrant. From the leaves is produced the henna or alhenna of the Arabs (cyprus of the ancients), a yellow dye which is used in Egypt and elsewhere by women to color their nails, and by men to dye their beards, and for similar purposes. It is the camphire of the authorized version of the Bible. (Adapted from L. H. Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1830-1831.)

Lilium rubellum (Liliaceae), 45322. **Lily.** From Manchester, England. Presented by Mr. I. Henry Watson.



COLD RESISTANCE OF A HYBRID ANONA.

(*Annona squamosa* on *Annona cherimola*, Miami Garden No. 1803–B.)

The freeze of February 3, 1917, when the temperature fell to 26.5° F. at the station at Miami, Fla., killed the leaves on all the anona trees in the garden and killed back to 1-inch wood many of the large trees. The trees of this hybrid between the sugar-apple and the cherimoya, while they lost their leaves, began at once to form new leaves and later numerous flower buds, and it is expected that a small crop of fruit will be produced. The photograph shows the hand of Mr. Edward Simmonds, who produced the hybrid, holding a branch from which all the old leaves have fallen and on which the new leaves have begun to start. (Photographed twenty days after the freeze by David Fairchild; P20443FS.)

A WHITE SAPOTE TREE IN GUATEMALA.

(*Casimiroa edulis.* See S. P. I. No. 39583.)

The unusual hardiness of this fruit tree, combined with the excellent shipping quality and unusual earliness of its fruit (ripening in May), entitle it to the serious consideration of Florida and California horticulturists. A tree of this species passed unhurt through the freeze of February 3, 1917, at Miami, Fla., when the temperature fell to 26° F., although it was coming into bloom at the time. In California it is considered as drought resistant as the pepper tree. Little attempt has yet been made to select superior strains of this fruit tree, much less to cross the known species. (Photographed by Wilson Popenoe, at Antigua, Guatemala, September 13, 1916; P16783FS.)

This fine lily is nearest to *L. japonicum* (*L. Krameri*), from which it differs by its broad speciosum-like leaves and smaller pink flowers with obtuse segments. The build is similar to that of *L. japonicum* but more oval in shape; stem 1 to 2 feet high, smooth, green-spotted and tinged with purple, lower part bare of leaves; leaves 15 to 20, horizontal, 4 to 5 inches long, ¾ to 1 inch wide, flowers 1 to 8, 3 to 4 inches long and as wide, fragrant, of the same color variations as *L. japonicum*, anthers yellow or orange. June to early July. Native of Japan. Allied to *L. japonicum* but possesses a better constitution, being rather more robust and permanent. (Adapted from Gardeners' Chronicle, May 21, 1898, p. 321, and from Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1869.)

Oryza sativa (Poaceae), 45316. **Rice.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2398a. Hanchow, China. June 7, 1917.) A glutinous variety of rice, said to ripen early. It is much eaten boiled like dumplings, with sugar sprinkled over, also eaten with boiled jujubes. This is a good type of rice for making puddings. The Chinese name is **No mi uk** which, being translated, means, 'Sticky rice grain'. This sample is to be tested like the preceding numbers (S.P.I.Nos. 45266 & 45267)." (Meyer.)

Phaseolus angularis (Fabaceae), 45298. **Adsuki bean.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2430a. Hanchow, Hupeh, China. March 7, 1917.) A large red adsuki bean, eaten boiled with dry rice and in soups; also pounded with sugar into a paste and used as a filling in certain cakes. Produces also bean sprouts of excellent juicy quality, which can be raised at home in winter. Chinese name **Hung tou (Hong doh)**, meaning 'Red bean'." (Meyer.)

Phaseolus aureus (Fabaceae), 45318. **Mung bean.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2432a. Ichang, Hupeh, China. March 19, 1917.) Mixed strains of mung beans grown mostly in Hupeh province for bean sprout production. In the future bean sprouts may be much more widely eaten than they are now. In very cold and bleak regions, such as Labrador, Northern Canada, Northern Siberia, etc, and aboard sailing vessels a-

long time away from ports, bean sprouts from **adsuki, mung,** and small **soybeans,** together with seedlings of **cress, mustard,** and **amaranth** are about the only fresh vegetables that can be raised. A dark, moist and warm place, like the inside of a cupboard, box, large jar, tin, etc., kept near a source of continuous gentle heat is necessary." (Meyer.)

Pisum sativum (Fabaceae), 45303. **Pea.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2436a. Ichang, Hupeh, China, March 24, 1917.) A medium-sized, pale yellow variety of pea, grown as a winter crop throughout the Yangtze Valley on rice lands which have been drained for the winter months. Sown in October and harvested in April. The peas are eaten either boiled with the pods when very tender, or shelled when old. When dry they are consumed in stews and soups, and baked into cakes. In the winter they are also eaten sprouted, after having been scalded. A fresh gelatine is also made from them, much eaten during the hot summer months, with sauce and pickles, as a 'pick me up' between meals. Chinese name **Wan tou (Wan doh).** To be tested as a winter crop in the southern sections of the Gulf States and in California." (Meyer.)

Pittosporum hosmeri longifolium (Pittosporaceae), 45244. From Honolulu, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. The variety differs from the species in that the leaves are very much longer, and the capsules are smaller. The tree is quite common at Kapua, South Kona, Hawaii, on the lava flows, and occurs also at Kilauea, and Hualalai, but does not reach such a height and size as at Puuwaawaa. The trees of the latter locality are loaded with fruit during June and July, while those of Kapua bear mature fruit during the month of February. However, the fruiting season of these, like nearly all the other Hawaiian trees, can not be relied upon. The fruits of *P. hosmeri* and variety are a source of food for the native crow which pecks open the large woody capsules and feeds on the oily seeds within. (Adapted from Rock, Indigenous Trees of the Hawaiian Islands, p. 161.)

Rubus bogotensis (Rosaceae), 45365. **Blackberry.** From Manizales, Colombia. Presented by Mr. M. T. Dawe. "*El Moral de Castilla.* This berry, which appears to grow

wild, attains a size and shape comparable to that of our best cultivated varieties, and to my mind has a better flavor than any of them. It may be found in abundance in the subtropical zone at an elevation of 6,000 to 8,000 feet; or, to be more definite, at a posada (dwelling house) about one hour below El Pinyon, toward Fusagasuga, known as El Roble. The rainfall is high here, for the entire Temperate Zone is included in the area of condensation. We worked at this locality during the first part of April, when the blackberry crop had not reached full maturity. I should say that, provided similar conditions prevail in other years, April 15 would be about the proper time to find the plants in fruit." (F. M. Chapman.)

Soja max (Fabaceae), 45289. **Soy bean.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2421a. Changsha, Hunan, China. May 12, 1917.) A peculiar variety of soy bean, of dull brown color, said to ripen very late. Locally much eaten when roasted, with salt sprinkled over, like salted peanuts. Very nourishing and appetizing. Well worth introducing to the American public as a new wholesome and nourishing sweetmeat. Chinese name **Ch'a hua tou (Za hua doh)**, meaning 'Tea flower bean'." (Meyer.)

Vaccinium reticulatum (Vacciniaceae), 45245. From Honolulu, Hawaii. Presented by Mr. Joseph F. Rock, Botanist, College of Hawaii. "Seeds of *Vaccinium reticulatum*, a species which grows up to an altitude of 10,000 feet on the big islands (Maui and Hawaii). It is the well-known **Ohelo** of the natives and is eaten and used similarly to your eastern *Vaccinium*." (Rock.) A low erect shrub, 1 to 2 feet high, the stiff crowded branches angular and densely foliose; leaves coriaceous; flowers solitary; berry globose, 1/3 to 1/2 inch in diameter, pale rose or yellow, covered with a waxy bloom. Found in the high mountains of Hawaii and Eastern Maui from about 4,000 up to 8,000 feet, where it grows gregariously, often covering large tracts of open ground. The shining fleshy berry, the **Ohelo,** is the principal food of the wild mountain goose. Although astringent it is not unpleasant to the taste, and makes a good preserve. (Adapted from Hildebrand, Flora of the Hawaiian Islands, p. 271.)

Vicia faba (Fabaceae), 45305. **Broad bean.** From China. Collected by Mr.Frank N.Meyer, Agricultural Explorer for this Department. "(No. 2438a. Ichang, Hupeh, China. March 24, 1917.) A medium large variety of broad bean, much grown as a winter crop on rice lands which have been drained for the cool season. The beans are much eaten, when fresh, like green peas and they form a very tasteful and nutritious dish. After soaking in water over night, the dry beans are often fried in oil, and salt sprinkled over them. They are then eaten as a delicacy, like salted peanuts. Chinese name **Ts'an tou (Tchan doh)**, meaning 'Silk worm bean', possibly on account of the silky hairs covering the outside and the inside of the pods. To be tested as a winter crop in the southern parts of the Atlantic and Gulf States and on the Pacific coast. As a summer crop in the inter-mountain regions and along the north Pacific coast." (Meyer.)

Vigna sinensis (Fabaceae), 45301. **Cowpea.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2434a. Hanchow, China. March 7, 1917.) A black-eyed, white cowpea eaten as a human food; boiled with dry rice generally, but also much used in stews and soups. The young pods are much consumed slightly boiled as a vegetable; they are also dried for winter use and in some localities pickled in brine. Chinese name **Pai chiang tou (Pai chiang doh)**, meaning 'White precious bean'." (Meyer.)

Notes from Correspondents abroad.

Mr. S. Iida writes from Yokohama, Japan, in a recent letter:

The Plum Blossom (*Prunus mume*), at Tsukigase in the province of Yamato is the most famous and largest orchard in Japan, but I gather that the cultivation has been curtailed in sympathy with the decline of the rouge industry in Kyoto, where there were formerly ten principal factories of the color but a single one survives at present. The burnt kernel of *P. mume* is said to be used in the manufacture. From this it seems that the demand as fruit alone is not sufficient for the orchard.

United States Department of Agrriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P.H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, Miss Bessie Broadbent, L. G. Hoover, R. N. Jones, and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City .
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS.

No. 139. NOVEMBER, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Aleurites	1247	Holcus	1249
Annona	1247	Persea	1249, 1250
Castanea	1247, 1248	Polygonum	1251
Chayota	1248	Pyrus	1252
Citrus	1248	Saccharum	1251
Cryptotaenia	1252		

Plates:

Pl. 227. A Guatemalan Avocado Ripening in August, *Persea americana*.

228. Guatemalan Jocotes, Spondias Mombin, *Spondias purpurea*.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

October 5, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Aleurites trisperma (Euphorbiaceae), 45480. **Soft lumbang** From Philippine Islands. Presented by Mr. Adn. Hernandez, Director of Agriculture, Manila, P. I. "**Soft lumbang** is one of the Philippine names given to this species to distinguish it from the true lumbang, *Aleurites moluccana*. It is a strictly tropical species of very limited distribution and is reported to fruit rather irregularly. The shell of the seed is much thinner and more easily broken than that of *A. moluccana*, and the oil obtained from the kernel is said to be very similar in drying properties to that of *A. fordii*, the tung oil tree of China." (R. A. Young.)

Annona marcgravia (Annonaceae), 45231. From Caracas, Venezuela. Presented by Mr. Henri Pittier, Director, Estacion Experimental y Catastro de Baldios. A tree with the trunk, form of the branches and color of the bark resembling those of the orange, but with different leaves, flowers and fruit. Its leaves are about one-half foot long, deep green and glossy above, pale green beneath, and tongue-shaped. The yellow flower is large and conspicuous, and has a sickening sweet odor. It is followed by the fruit, which ripens in December and January. This fruit, which is conoid in shape and about 5 inches in greatest diameter, is green and white mixed, or pale green on the outside, and the surface is areoled, with a brown tubercle on each areole. Not until the fruit falls of its own accord is it eaten, and then it is so soft that it can be peeled with the fingers. The yellowish pulp has an odor like fermenting bread dough, to which honey has been added, with a sweetish subacid and somewhat bitter taste. The seeds are oval, golden yellow and glossy, smooth and hard. This tree is a native of Brazil and Venezuela. (Adapted from Safford, Contributions from the National Herbarium, vol. 18, part 1, pp. 25-28, from Pisco and Marcgrave's description of the Brazilian "**araticu ponhe**", in 1648.)

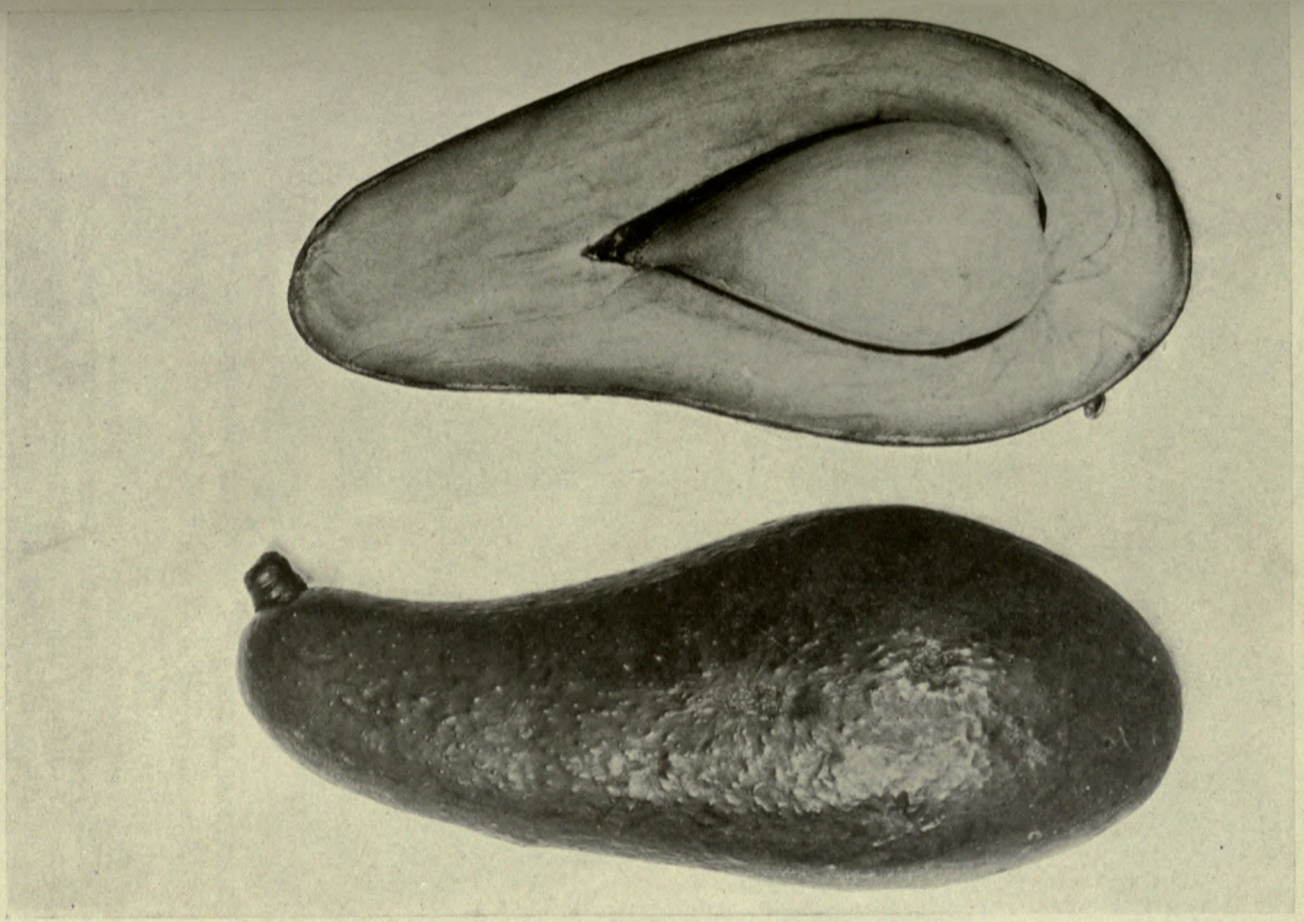
Castanea crenata (Fagaceae), 45334. **Chestnut.** From Bell, Maryland. Presented by Dr. W. Van Fleet, of this Bureau. Bell No. 1. Fourth generation by straight selection. Started by a variety cross between two early, prolific types of *C. crenata*. Very large nut, with good cooking qualities, but poor eating qualities when raw. The tree has a good habit, with thin, handsome branches. The trunk is clean and bright. Leaves very narrow. Dr. Van Fleet has about 40 trees of this selection.

Castanea crenata (Fagaceae), 45337. **Chestnut.** From Bell, Maryland. Presented by Dr. W. Van Fleet, of this Bureau. Bell No. 4. Fourth generation, by selection. The trees have very much the same habit as S. P. I. No. 45334, 45335 and 45336, and the nuts are about the same size—very large. The nuts have good eating qualities, and are better than those of the numbers referred to above. This number is eminently worthy of propagation and dissemination.

Chayota edulis (Cucurbitaceae), 45540. **Chayote.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 197a. Guatemala, Guatemala, November 7, 1917.) **Guisquil de Santa Maria.** Locally considered one of the very best varieties. It is a short, broad fruit, compressed on the sides, and weighing from 12 ounces to a pound. The surface is smooth, free from corrugations, pale to bright green in color. Green-fruited guisquiles are considered by the Guatemalans to have more flavor than the white-fruited varieties. All smooth, small to medium-sized guisquiles are called **peruleros**; the spiny or rough fruits are termed simply guisquil, in most instances. Occasionally they have distinguishing names, such as **guisquil de Santa Maria.**" (Popenoe.)

Chayota edulis (Cucurbitaceae), 45541. **Chayote.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 198a. Guatemala, Guatemala. November 7, 1917.) Large **white perulero.** Probably the best of the **perulero guisquiles.** A pear-shaped, waxy-white fruit without prickles, and with a surface free from wrinkles or corrugations. Weight about 5 ounces. One of the rarest varieties in the market." (Popenoe.)

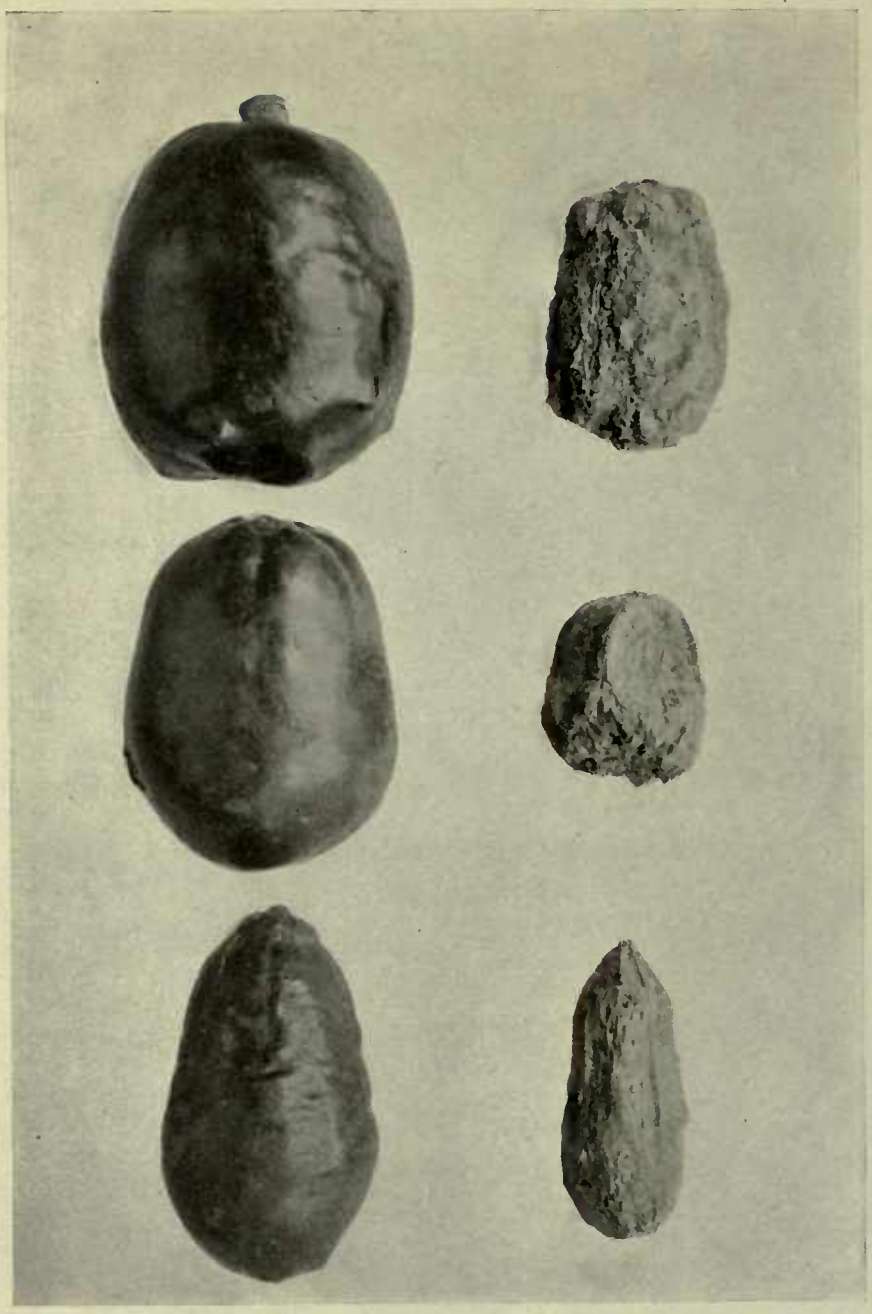
Citrus grandis (Rutaceae), 45249. **Pummelo.** From Kerman, Persia. Presented by J. N. Merrill, Captain, Commanding First Regiment of Cavalry, Persian Army. "Seeds of the Persian 'pumaloe', a fruit like that of China and the Philippines, about 8 or more inches in diameter, with a skin that is spongy, very thick, and oily. The fruit is slightly bitter and acid, but not disagreeable to the taste. Used by the Persians as a decorative fruit; a preserve made by boiling the skin with sugar is highly esteemed. The fruit is grown at Khabis, some 65 miles east of here, elevation 1,800 feet, near the edge of the great desert of Persia.



A GUATEMALAN AVOCADO RIPENING IN AUGUST.

(*Persea americana.* See S. P. I. No. 45505.)

The Akbal avocado is a variety from Amatitlan, Guatemala (altitude 3,900 feet), remarkable for its earliness in ripening. As will be observed, its form is rather objectionable, being longer and more slender than is considered ideal by American avocado growers, but its quality is excellent. In Guatemala it ripens in August and September, while most of the varieties in the same region do not commence to ripen before January or February. For this reason it is thought that the Akbal variety may be of value for California, where early-ripening varieties of the Guatemalan race are much desired. (Photographed by Wilson Popenoe, Guatemalan collection No. 32, at Amatitlan, Guatemala, November 8, 1917; P17411FS.)



GUATEMALAN JOCOTES, SPONDIAS MOMBIN.

(*Spondias purpurea.* See S. P. I. No. 11007.)

One of the commonest and most popular fruits of the Guatemalan highlands. It is most abundant between the altitudes of 2,000 and 6,000 feet. There are many varieties, or more properly speaking, seedling races. The three here shown are the best known: the upper one is called *jocote de corona,* the one in the center *jocote amarilla,* and the lower one *jocote largo.* The *jocote de corona* is by far the best of the three. Its color is an attractive yellow and scarlet, and it has an aromatic, almost pungent flavor resembling that of the cashew (*Anacardium occidentale*). The *jocote amarilla* is rather inferior in quality, but it is much used when boiled. The *jocote largo* is very similar in character to *jocote amarilla,* and both are deep orange yellow in color. The jocotes are easily propagated by cuttings, and bear most profusely. The large seed is an undesirable feature, but superior varieties are occasionally seen and merit vegetative propagation. (Photographed by Wilson Popenoe, Guatemala City, Guatemala, October 4, 1916; P16836FS.)

Personally, I found the fruit, when eaten with powdered sugar, a good dish, though the Persians do not eat it." (Merrill.)

Holcus sorghum (Poaceae), 45348. **Kafir corn.** From Johannesburg, South Africa. Presented by Mr. J. Burtt-Davy, Botanist, Agricultural Supply Association. "Kafir corn grown by natives in the Vereeniging District of the Transvaal and claimed by them to be earlier in maturing than any other sorts grown in the neighborhood. This strain may prove of immense value in areas having a short growing season. The rainfall at Vereenigning averages about 27 inches and comes almost entirely in the summer." (Burtt-Davy.)

Persea americana (Lauraceae), 45505. **Avocado.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 195. Avocado No. 32. **Akbal.** Guatemala, Guatemala. November 6, 1917.) This is a variety noteworthy for earliness, and it has been included in the set primarily for this characteristic. It is, however, of very good quality and has no visible defects except a slightly undesirable shape. Judging by its behavior in Guatemala, it should be the earliest variety in the collection, but it is not safe to depend upon its retaining this characteristic in the United States, since slight local variations in soil or climate sometimes affect the period of ripening very noticeably, and its earliness in Guatemala may not be altogether an inherent characteristic. This is rather a warm region, hence there is nothing to indicate that the variety will be unusually hardy. The crop harvested in the fall of 1917 was a good one. According to the owner, it was 600 fruits, but judging from its appearance while still on the tree it must have been considerably more than that. The bearing habits of the tree were only under observation for one season, but they give promise of being very satisfactory. The flowering season is in November and December, and the fruit ripens from the following August to November. It is fully ripe and in perfect condition for picking by the middle of October, whereas the average variety of the same region is not mature until January at the earliest. In two characteristics this variety does not seem to agree with the Guatemalan race. It has a very thin skin and the seed coats do not adhere closely to the cotyledons. A few other varieties showing these same

characteristics were seen in the same locality, and it is possible that they may not be true Guatemalan avocados, though in most respects they seem to belong to this race. In form this fruit is long and slender, sometimes slightly curved, and sometimes becoming pyriform. It is medium-sized, weighing about twelve ounces. The surface is quite smooth, and green in color. The skin is thin, and surrounds the thin yellow flesh, which is of very good quality and shows no fiber or discoloration. The seed is medium-sized, and while it does not rattle in its cavity, it does not fit as snugly as it does in nearly all other Guatemalan varieties." (Popenoe.)

Persea americana (Lauraceae), 45560. **Avocado.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 212. Avocado No. 26. **Manik.** Guatemala, Guatemala. November 13, 1917.) A productive and rather early variety of excellent quality. It is a medium-sized fruit of pleasing form and clear yellow flesh of unusually rich flavor. The parent tree is growing in the Finca La Polvora', in Antigua, Guatemala. The elevation is about 5,100 feet. Antigua does not experience severe frosts, hence it is impossible to determine, in advance of a trial in the United States, whether or not the variety is any hardier than the average of the Guatemalan race. The flowering season is February and March. The tree blooms profusely and some years sets enormous crops of fruit. In 1917 a very heavy crop was ripened. The 1918 crop is much smaller. In general, the bearing habits of the tree give promise of being unusually good, there being a tendency for the fruits to develop in clusters. The season of ripening is properly February to June, but fruits picked early in December developed fairly good flavor upon ripening in the house. The season may be termed early to midseason. The fruit is more variable in form than that of some varieties. The range is from oval to slender pyriform, the majority of the fruits being of the latter shape, without, however, a well-defined neck. The weight varies from 8 to 12 ounces. The surface is slightly roughened, and green in color. The skin is moderately thick, the flesh rich yellow, quite free from all fiber or discoloration, and of a very rich and pleasant flavor. The seed is a trifle large in some specimens, small in others, being medium-sized or rather small on the average. It is quite tight in the seed cavity." (Popenoe.)

Polygonum tinctorium (Polygonaceae), 45605. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2443a. Hankow, China. June 14, 1917.) An annual herb, much cultivated throughout northern and central China for the blue dye it produces, which however, fades easily. It is sown on rich lands towards the end of February, and the first cutting is made during June, and a much smaller one during August. Further north the sowing takes place later and but one cutting can be obtained. To procure the dye-material the plants are deposited in plastered pits, water is poured over them and they are allowed to decay for several weeks; then the stems are taken out and the water is allowed to evaporate. When at last the slimy mass in the pit has become sufficiently dry, quicklime is added and thoroughly mixed and the material is allowed to dry out until it can be well worked. It is then taken out and kept in tubs, barrels, and other vessels until needed for dyeing. The freshly dyed cloth posseses a most unpleasant odor, which can often be detected for a considerable distance. Slowly, however, the wind takes away the odor and garments can then be made from it. The dye seems to be used almost exclusively for the dyeing of coarse cotton cloth. Chinese name of the plant **Liao lan**." (Meyer.)

Saccharum officinarum (Poaceae), 45519. **Sugar cane.** From Reduit, Mauritius. Presented by the Director, Department of Agriculture. **White Tanna.** This is the widest grown of all the sugar cane varieties on the Island of Mauritius, occupying forty-seven per cent of all the land given over to sugar cane raising. It is a variety which is grown equally well on the highlands or lowlands. There are two sources from which this variety came. It arose as a sport on several estates of the Colony, and has since been widely cultivated. It was also received from the Department of Agriculture of New South Wales in 1895. The present variety is probably decended in part from each of the sources mentioned above. (Adapted from Henri Robert, Sugar-Cane, Varieties in Mauritius.)

NOTES ON BEHAVIOR OF PREVIOUS INTRODUCTIONS.

Rev. Jno. B. Katzner, of Collegeville, Minnesota, in letter dated December 10, 1917, reports: "All trees and plants to succeed in Minnesota must be able to stand a cold of from 35 to 40 degrees below zero. The many varieties of pears from northern China and Manchuria I received from the United States Department of Agriculture could not endure that cold. Yet 2 varieties of pears, Nos. 21880 (*Pyrus ussuriensis*) and 21982 (*Pyrus betulae folia*), after freezing back from 3 to 4 winters became perfectly hardy and have not lost a bud since, and grafts made from them are just as hardy. These trees are now 7 feet high and may bear next season. I regret not to have kept the other varieties that long on trial. Maybe some more would have been found hardy in that time. But what is the cause of these 2 varieties becoming hardy after freezing down to the ground for several years? It may sound somewhat heterodox in horticulture, but I look at it this way: These varieties of pears along with some others coming from northern China and Manchuria, would have been hardy originally in Minnesota if they had been propagated directly in our State, but having been grown for several years in the mild, congenial climate of California, these pears have naturally lost much of their original hardiness."

Notes from Correspondents abroad.

Mr. Barbour Lathrop, writes in a recent letter: "The second lot of seed, *Cryptotaenia japonica* (Anglicized by the Yokohama Nursery Company to 'Japanese Celery' and known in Japan as 'Mitsuba') produces a vegetable that pleased my palate on the two occasions on which I tried it. It is very popular in Japan, its consumption coming next after rice and soy beans. As a crop it is very profitable. Enclosed is an article by the Nursery Company on the methods of its planting and eating. Those people say it, (Mitsuba), has not been introduced into America or any 'Western Country' - and even if it shouldn't prove a success, experiments with it would certainly be interesting and possibly our people may take to it quicker than they have to 'Udo'."

United States Department of Agrriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P.H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, Miss Bessie Broadbent, L. G. Hoover, R. N. Jones, and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

Buy Liberty Bonds and Keep Them.

THE FOURTH LOAN IS A FIGHTING LOAN.
EVERY SUBSCRIBER TO THE LOAN STRIKES
A BLOW FOR LIBERTY, FOR VICTORY.

PLANT IMMIGRANTS.

No. 140. DECEMBER, 1917.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Actinida	1255	Juglans	1259
Agropyron	1263	Lilium	1259, 1262
Amaranthus	1255	Malpighia	1260
Annona	1256	Medicago	1263
Avena	1257	Pennisetum	1261
Castanospermum	1257	Persea	1263
Citrus	1258	Prunus	1262, 1263
Crataegus	1258	Pterocarya	1261

Plates:

Pl. 229. The Soncoya, an interesting fruit tree from Guatemala, *Annona purpurea.*
230. Resistance to cold of the Guatemalan Avocado, *Persea americana.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

October 11, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Actinidia chinensis (Dilleniaceae), 45588. **Yang tao.** From Krling, China. Presented by Rev. John Berkin. The **Yang tao,** as this deciduous climber is known in Szechwan province, where it is native, has attracted considerable attention from travelers and missionaries in China, because of the high quality of its fruits, and the ornamental value of the plant. Single plants often grow 30 feet in length so that the vine will cover large areas of trellis. The leaves have a plush-like texture, and an unusual dark-green color. The young shoots are bright pink and villous-pubescent. The size and regular spacing of the leaves make this climber valuable where large areas of foliage are desired. The flowers are buff-yellow to white, fragrant, and of large size, being from 1 to 1½ inches in diameter. The abundance of these flowers adds greatly to the beauty of this plant, and enhances its value as an ornamental. The following account of the fruit was written by Mr. Wilson while in China. "Fruits abundantly produced, ovoid to globose, 1 to 2½ inches long, 1 to 1¼ inches across; epicarp membranous, russet-brown, more or less clothed with villous hairs. Flesh green, of most excellent flavor, to my palate akin to that of the gooseberry, but tempered with a flavor peculiarly its own. The fruit is excellent when fresh, and also makes very fine jam and sauce. A number of the Yang tao fruits which were produced by vines growing in California were shipped to Washington and have been eaten by a number of people of discriminating taste, and the universal opinion appears to be that we have in this Chinese fruit a distinct new possibility for home gardens in Southern regions. What American horticulturists will do with it remains to be seen. It is now essentially a wild fruit, for the Chinese have done no more with it than Americans have with their largest wild fruit, the papaw (*Asimina triloba*). While this plant is not hardy in regions of severe winters, the rapid growth in the spring will make it a valuable ornamental, even in those regions where it is killed to the ground each winter." (See fuller description in "Some Asiatic Actinidias," by Fairchild, issued January 18, 1913, in Bureau of Plant Industry Circular No. 110.)

Amaranthus paniculatus (Amaranthaceae), 45535. **Huauhtli.** From Mexico. Presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico City. An annual, with entire leaves, bearing the abundant, grainlike edible

seeds in dense panicles. Some plants produce white seeds, and some produce black. The white seeds are those chiefly used by the natives. This plant is found both in cultivation and growing wild. The seeds ground and cooked in the form of small cakes known as **alegria**, are eaten in large quantities by the poorer classes, especially during a time of scarcity of corn. **Huauhtli** was cultivated by the Aztecs before the discovery of America. It occupied an important place in the fare of the people, and accounts show that every year 18 granaries, each with a capacity of 9,000 bushels, were filled by Montezuma. Often the tribute exacted by the Aztecs from the people they conquered would take the form of a certain amount of this grain. It was so closely connected with the life of the people that it figured in religious observances. Spanish historians, writing in the first half of the 17th century, give accounts of how the ancient Mexicans made figures of their gods out of the flour obtained from the seed. The figures were carried in procession, and at the end of the ceremony were broken up, and served to the people as a form of communion. (Adapted from Safford, A Forgotten Cereal of Ancient America, Proceedings of the Nineteenth International Congress of Americanists, p. 256-297, 1917.)

Annona diversifolia (Annonaceae), 45548. From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 205a. Guatemala, Guatemala. November 8, 1917.) The *anona blanca*, from Chiquimula (elevation 1,400 feet). This species is not known in the highlands of Guatemala, nor have I seen it elsewhere except in the vicinity of Chiquimula and Joeotan, both in the southeastern part of the republic, close to the border of Honduras. The tree strongly suggests *Annona squamosa* in appearance, but is easily distinguished by the leaf-like bracts at the base of the branchlets. The fruit is much larger than that of *A. squamosa*, resembling more closely that of *A. reticulata*. It is generally heart-shaped, up to 5 or 6 inches in length, with the carpellary areas indicated by incised lines on the surface, which is pale glaucous green in color. The skin is nearly a quarter of an inch thick, the flesh is said to be tinged rose color when ripe, and the seeds are much larger than those of either *A. squamosa* or *A. reticulata*. The season of ripening in southeastern Guatemala is September. While I have not been able to test this fruit thoroughly,

it seems to be far superior to *A. reticulata*, and to approach the cherimoya in quality. If it succeeds at low elevations in the tropics, as seems to be the case, it may prove to be a very valuable species for cultivation in regions which are too hot for the cherimoya. It should be given a careful trial in such regions as South Florida, Cuba, and Porto Rico. I do not know how productive the tree may be, since I have seen only two specimens in fruit, and these were growing under rather unfavorable conditions. The seeds forwarded under this number were taken from fruits purchased in the market of Chiquimula by Mr. B. B. Williams, of the Friends' Mission." (Popenoe.)

Avena sativa (Poaceae), 45565. **Oats.** From Paris, France. Presented by Vilmorin-Andrieux & Company. "*Hybride noire tres hative*" (very early hybrid black). This variety was obtained about 10 years ago at the experimental farm at Verrieres by crossing the two varieties, Australia and Joanette; it has been carefully selected, and has proved itself to be a well-mixed variety which is vigorous, tillers well and attains a height of 4 to 5 feet according to cultural conditions. The panicle is well filled and perfectly continous, and the spikelets contain two and often three beautiful, black, full, faintly awned grains. In our comparative studies, this has constantly ripened 8 or 10 days in advance of the earliest varieties, giving a greater yield. Sown March 1 it heads early in June, and ripens about July 20. In brief, it is highly profitable, uniting the best qualities, extreme earliness, abundant production, and resistance to rust and shattering." (Vilmorin-Andrieux catalogue.)

Castanospermum australe (Fabaceae), 45504. **Moreton bay chestnut.** From Dominica, British West Indies. Presented by Mr. Joseph Jones, Curator, Botanic Gardens. The **Moreton bay chestnut** is a large ornamental tree native of Queensland and New South Wales, where it is said to grow abundantly along rivers. The leaves are odd-pinnate, and are composed of from 11 to 15 broad, thick, entire leaflets. The large flowers are yellowish green on opening, but later change to a deep yellow-orange. They are borne in loose axillary racemes usually about 5 inches long. The pod is 8 to 9 inches long, with 4 to 5 globular seeds larger than Italian chestnuts.

Bonds Buy Food For Soldiers. Buy Liberty Bonds.

The large evergreen leaves and the racemes of bright orange-yellow flowers make an attractive picture in any subtropical garden. The large globular seeds are roasted and eaten like chestnuts. The tree has been introduced into Southern California, but is not common. (Adapted from Bailey, Standard Cyclopedia of Horticulture, and Berger, in Gardeners' Chronicle ser. 3, vol. 38, p. 244.

Citrus ichangensis (Rutaceae), 45534. **Ichang lemon.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 145b. Kingmen, Hupeh, China. September 26, 1917.) A citrus fruit called **Hsiang yuan,** meaning 'fragrant round'. It exists in many varieties, and is able to withstand colder temperatures than the tangerine and kumquat but is not as hardy as *Poncirus trifoliata* (*Citrus trifoliata*). The rind exhales a delightful fragrance and the Chinese use the fruits as room-perfumers and carry them about instead of perfumed handkerchiefs. Since they possess an abundant juice of good quality, foreign residents use these fruits for making lemonade. If it were not for the many very large seeds this fruit could well be substituted for the ordinary lemon; as it is, it may be grown considerably north of the true citrus belt to supply a home product from which to make refreshing drinks." (Meyer.)

Crataegus stipulosa (Malaceae), 45575. **Manzanilla.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 216a. Guatemala, Guatemala, November 20, 1917.) A native species of Crataegus, well known in the Guatemalan highlands, where it occurs both wild and cultivated. Seed was previously sent in under No. 32a. (S.P.I.No. 43430). The manzanilla is a large shrub or small, erect, slender tree, about 20 feet tall; when old, sometimes having a thick trunk a foot or more in diameter at the base, but never developing to a greater height. In spring it produces white flowers resembling apple blossoms. In early fall, commencing about October, the fruits ripen, and from this month are abundant in all the markets until after Christmas. They are much used for decorative purposes, after being strung on long threads. They are eaten in several ways, principally stewed and in the form of jelly. For stewing

THE SONCOYA, AN INTERESTING FRUIT TREE FROM GUATEMALA.

(*Annona purpurea.* See S. P. I. No. 43426.)

The soncoya is a handsome tree, characteristic of the Guatemalan lowlands. While it is common in the forest as a wild tree, it is also seen in gardens and dooryards, where it is planted for its large prickly fruits. It is questionable if the soncoya will withstand frost, but it should succeed in extreme southern Florida. (Photographed by Wilson Popenoe, at Ayutla, Guatemala, September 27, 1916; P16821FS.)

RESISTANCE TO COLD OF THE GUATEMALAN AVOCADO.

(*Persea americana.*)

The freeze of February 3, 1917, at Miami, Fla., subjected the avocados at the Plant Introduction Garden to a temperature of 26.5° F. for a few minutes. This temperature froze the foliage and twigs of the avocado tree of the tender West Indian type but affected those of the Guatemalan type much less severely and did not injure at all those of the Mexican type. In the illustration Admiral Ross is touching the dead brown leaves of a shoot coming from the West Indian seedling stock upon which was budded February 7, 1914, the Grande variety of the Guatemalan type. This bud has produced a good-sized tree in the three years and scarcely a leaf was injured by the freeze. (Photographed by David Fairchild, at the Miami Plant Introduction Field Station, February 12, 1917; P20427FS.)

they are first boiled with wood ashes, after which the skin is easily removed; they are then placed in hot syrup and boiled for a short time. Their flavor somewhat suggests the apple, and is very pleasant. The fruits look like small apples, being nearly spherical in form, yellow in color, with russet dots and a blushed ckeek, and having a slender stem. The largest ones are an inch and three quarters in diameter. The ordinary size is about one inch. The thin skin surrounds a rather dry, yellowish, mealy pulp and three large seeds. The plant is easily grown and should succeed in California and Florida." (Popenoe.)

Juglans mollis (Juglandaceae), 45352. **Walnut.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 180a. Finca Chejel, Baja Verapaz, Guatemala. October 15, 1917. The wild walnut of the Verapaz. It is not a common tree; but seen occasionally on mountainsides and along water courses, at elevations of 1,500 to 4,500 feet, so far as my own observation goes. The tree is only moderately large, rarely reaching a greater height than 40 to 45 feet. The nuts, which are sometimes produced very abundantly, are as large as a good specimen of *Juglans nigra*, but have a thicker shell and consequently less kernel. This species is of interest in connection with the attempt now being made to obtain good nut-bearing trees for the tropics. It should be planted in such regions as south Florida and Cuba. Since it appears to thrive in Guatemala under a rather wide range of climatic conditions it may succeed in many parts of the tropics and subtropics." (Popenoe.)

Lilium philippinense (Liliaceae), 45570. **Benguet lily.** From Manila, P.I. Presented by Mr. Adn. Hernandez, Director, Bureau of Agriculture. "This new white trumpet lily seems destined to become of very great value to both private and commercial growers. The short time necessary to flower it after potting surprises all who are growing it for the first time. We found last year that it was all the introducers claimed for it, and from a hatch of small bulbs potted September 8 we cut flowers December 3 of this year. These bulbs were grown in a cold-frame for nearly half that period or they would have flowered earlier. The long, pure white, sweet-scented flowers arrange beautifully in

vases. The stems are sufficiently strong, without being too rigid, as is the case with other forcing liliums, and the foliage is so much more graceful than that of other lilies that any flower lover would not hesitate a moment which variety to select when both were purchaseable. For floral designs this lily is superior to any other white variety and we fully expect it will in a few years be as much a market necessity as *Harrisii* and *longiflorum* now are. Six or seven bulbs may be grown in a 6-inch pot or pan and a dozen or more in an 8-inch pan for good effect." (Florist's Review, December 13, 1917.)

Malpighia sp. (Malpighiaceae), 45506. From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 196. Guatemala City, Guatemala, November 6, 1917. **Azerola**, from Amatitlan (elevation 3,900 feet). The name **azerola**, which properly belongs to a species of Crataegus is applied, in Central Guatemala, to a large Malpighia, whose fruits are not unlike those of the Barbados-cherry (*Malpighia edulis*). I have only seen the plant in a few places., it is most abundant at Amatitlan, where it is seen in a large proportion of gardens and dooryards. This species is much larger than *M. edulis*, often becoming a small bushy tree 20 feet in height, but more commonly seen as a large shrub, spreading in habit, with a dense crown. The leaves, when young are covered with a thick whitish tomentum, when mature they are membranaceous, elliptic-acuminate in form, about four inches long, cuneate at the base, bright green and glabrous above, heavily pubescent, with the venation prominent below. The flowers are produced in small axillary clusters. Individually they are scarcely an inch broad, with clawed, crepe-like petals of lilac-pink color. The fruits, which ripen mainly during August and September are the size of a large cherry, but flattened and sometimes pointed toward the apex. They are bright red when fully ripe, with a tender skin and juicy, whitish flesh of peculiar subacid flavor. The seeds, three in number, are roughly winged. The character of the growth suggests that this plant may be slightly hardy. It has not been seen in the lowlands, but is grown at elevations of 4,000 to 5,000 feet, where the climate is comparatively cool, but not cold enough to experience severe frosts. The

plants produce abundantly. While not a fruit likely to become of great importance in the United States, it possesses sufficient interest and value to merit a trial. The regions in which it seems likely to succeed are, Florida, southern Texas, and California." (Popenoe.)

Pennisetum merkeri (Poaceae), 45572. **Napier fodder-grass.** From Rhodesia. Presented by Mr. J. Burtt-Davy, Botanist, Agricultural Supply Association, Johannesburg, South Africa. "The great value of prolific and drouth-resistant fodder plants, which are generally very difficult to procure, is well known to stock owners; and this species which is but little known, as yet, can be most highly recommended for both of these qualities. During the last season, which was very dry and most disastrous for stock, this grass grew to a height of nearly 11 feet and produced a large quantity of succulent, nutritious, and fattening fodder. This is greatly relished by the stock, and is, according to analysis, much richer than green maize. A reliable official says: 'There is a concensus of opinion that in this plant we have found a fodder of great value and one which remains green even during such long periods as from six to eight months when other herbage is parched up or destroyed. It grows rapidly to the height of 12 feet or more in favorable weather, thrives well in various soils, and resists both frost and drought to a remarkable extent. At 7 feet high it has produced 12 tons of green fodder per acre, and a few months later 15 tons, making a total yield of 27 tons per acre. It is everlasting when once established, and the tufts or stools increase in size after each cutting or when grazed off. It should prove of untold value to farmers in South Africa who suffer much loss through frequent and protracted droughts, and in the East Indies and other countries where light rainfall and semi-arid conditions obtain. As a prolific and drought-resistant plant it promises to prove one of the very best brought into cultivation." (B. Harrison.) See S.P.I. No. 43241 for previous introduction.

Pterocarya stenoptera (Juglandaceae), 45587. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2447a. Kingmen,

Hupeh, China. September 5, 1917.) An ornamental tree belonging to the walnut family, growing to a large size. The foliage is pinnated and of fresh green color. In early spring, before the leaves are out, the trees are loaded with long greenish brown, staminate catkins, which give them a festive appearance; these are followed by racemes of small winged fruits which persist on the trees until September. The young foliage is covered with small yellow-brown glands and when rubbed smells like sour apples. The trees love moist situations, especially near running water and in porous soil; however, they also thrive on dry fields, but do not grow so fast nor so large as when near water. It is one of the best flowering trees in the Foreign concessions at Hankow and Shanghai and is called by foreigners the 'Chinese ash' on account of its resemblance to a Fraxinus. Chinese name **Maliu shu**, meaning 'Fiber willow tree', often abbreviated to **Liu shu**. This is a very promising shade tree for streets, parks and gardens in those sections of the United States where the summers are moist and warm and the winters but moderately cold. It does well where rice and cotton mature fully, and where the large-leaved privet (*Ligustrum lucidum* Ait.) and the tea-olive (*Somanthus fragrans* Lour.) remain out-of-doors the year round." (Meyer.)

Notes on Behavior of Previous Introductions.

In a letter dated September 7, 1918, Miss Alice Cooper, of Mayesville, South Carolina reports:

"S.P.I. No. 18586, *Prunus sp.* This bore heavily and was a beautiful sight. Some of the plums were almost as big as our largest "Abundance", almost black and covered with a purple bloom. The tree was admired by many for its beauty, and all agreed that the fruit was fine. It was so solid and meaty that it could be cut in slices and had a splendid flavor. We are delighted with it. *Lilium sp.* S.P.I. No. 40751. **Lily.** This grew nearly four feet tall and bore four of the largest white lilies I ever saw. One bud was six and one half inches long. The blooms were trumpet shaped, pure white, fragrant. Stamens brown."

"*Prunus armeniaca* 38281. **Chinese Apricot** has done exceptionally well, the leaves are healthy and free from shot-hole fungus. No American variety that I

have tried here ever held their leaves until fall, while this one looks beautiful and I believe will be a success here. The *Amygdalus persica nectarina*, **Quetta nectarines** have done well, leaves are free from fungus. *Prunus domestica*, **Papagone prune** (40498) has done well, leaves are free from fungus." V. L. Deane, Seabrook, Texas, September 12, 1918.

In a letter dated March 18, 1918, Mrs. J. Radford Carter, of Merritt, Florida, reports the following results with *Persea americana*:

"We had an unusually cold February this year and during the severe cold, we kept our young avocado plants banked in sand; the old trees went through all right, excepting a few frosted lower limbs. Lower limbs of the mango were frosted also, but there will be plenty of fruit this summer."

Excerpts from a letter under date of April 7th, 1916, from John Bracken, Prof. of Field Husbandry, University of Saskatchewan, Saskatoon, Saskatchewan.

"Your communication of the 29th ult., enclosing photograph of one of our plats of *Medicago sativa*, **semi-Palatinsk alfalfa** is to hand. This plat did particularly well last year. It yielded more than any of our other alfalfa, but, of course, the latter were produced under rather different conditions. The semi-Palatinsk you photographed yielded 10,562 lbs. green weight in the first cutting; 5,520 in the second, and 4,875 in the third. The dry matter in the first cutting was 27.22% of which 21.77% was protein. A species of grass that we secured through your Bureau that has done very well here is *Agropyron elongatum*."

Bonds Build Ships. Buy Liberty Bonds.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, D. A. Bisset, Miss Bessie Broadbent, L. G. Hoover, R. N. Jones, and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. C. C. Logan, Luray, Va.
Mr. H. Nehrling, Gotha, Fla.
Miss Eliza R. Scidmore, Washington, D. C.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.

PLANT IMMIGRANTS.

No. 141. JANUARY, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Aesculus	1265	Pavetta	1267
Amygdalus	1271	Pogonopus	1268
Brassica	1265	Prunus	1268
Corylus	1265	Pterogyne	1269
Diospyros	1271	Ribes	1270
Inga	1266	Rubus	1270
Licoris	1266	Saccharum	1270

Plates:

Pl.231. Four-Year-Old Feijoa Bush at Tallahassee, *Feijoa sellowiana*.

232. The Scented Melon of Guatemala, *Sicana odorifera*.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

November 14, 1918.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Aesculus wilsonii (Aesculaceae), 45532. **Horse-chestnut.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2452a. Kingmen, Hupeh, China. September 24, 1917.) The interesting and beautiful Chinese horse-chestnut, a tree deserving to become widely planted in the southern United States. Not as charming as the European horse-chestnut but better able to withstand hot summers and long periods of drouth. To be planted in those sections of the United States where the temperature does not fall much below zero. Chinese name **So lo shu (Swa loh shu).**" (Meyer.)

Brassica pekinensis (Brassicaceae), 45529. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2449a. Kingmen, Hupeh, China, September 13, 1917.) A variety of **pai ts'ai** said to grow into large solid heads when planted in the fall and given sufficient space in rich moist soil. When sown thickly in beds in spring or fall and not transplanted, it is pulled up with the roots and eaten chopped up and boiled like spinach. Can also be employed in sauerkraut making. Chinese name **Tung pai ts'ai** meaning 'Winter white vegetable.' To be tested especially in the southern sections of the United States." (Meyer.)

Brassica pekinensis (Brassicaceae), 45530. **Pai ts'ai.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2450a. Kingmen, Hupeh, China, September 13, 1917.) A variety of **pai ts'ai** with very dark green, bullate foliage, not making a closed head. Sown out in fall and transplanted at distances of half a foot or more in all directions. It needs a moist, muck soil to grow to perfection and in mild climates it keeps on growing throughout the whole winter. It is eaten in soups, chopped up like spinach. Chinese name **Hei pai ts'ai (Gho pai tsia)**, meaning 'Black, white vegetable.' To be tested mainly in the southern United States." (Meyer.)

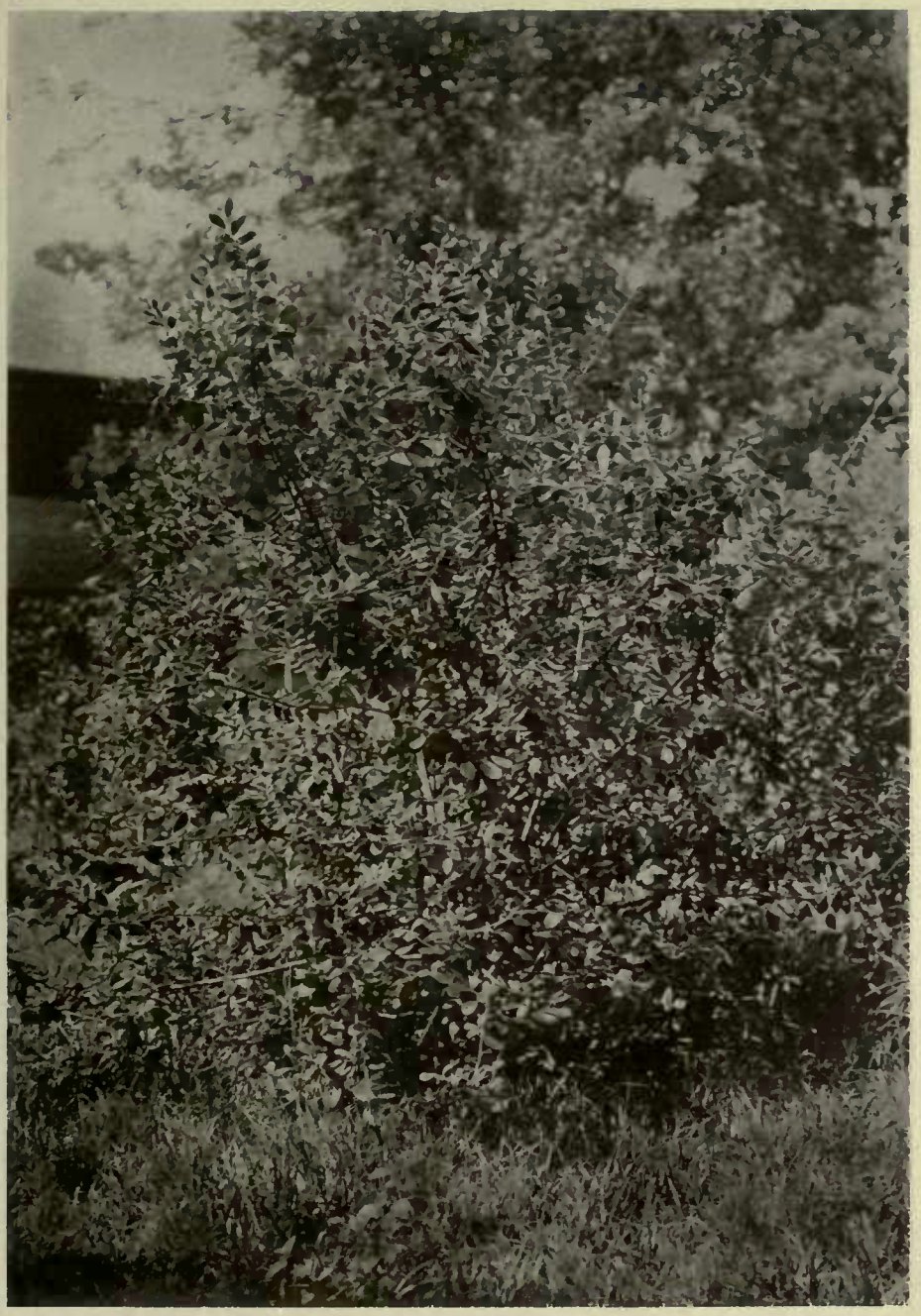
Corylus avellana (Betulaceae), 45692. **Filbert.** From France. Presented by Mr. Edmond Verain, St. Jean leblanc, par Orleans, Loiret. **d'Alger.** This is a well-known hazelnut, and because of its many hundreds of years of cultivation has received many different names. Goeschke, in Die Haselnuss, mentions 41 names which have been given to this plant. The bush is of low

much-branching habit, spreading widely by means of suckers. It is a very prolific shrub, and is one of the most fruitful of all the varieties of hazelnut. The leaves are of medium size, roundish or oval-elliptic. The nut is medium-sized, 20 to 22 mm. long, and very long-pointed. Seldom grows singly, but is usually found in groups of 2 to 5. Shell dark brown, later even becoming brownish black. The upper half is covered by a greyish wooly tomentum which becomes stronger towards the tip. The kernel, which has a sweet almond-like taste, is oval and entirely fills the shell. Blooms in mid-spring; ripens early - from the middle to the end of August depending on the climate. Older pomological workers state that this nut comes true to seed; but more recent workers state that only about one fifth of the seed planted comes true to the variety. It is a nut to be universally recommended. (Adapted from Goeschke, Die Haselnuss, p. 78.)

Inga sp. (Mimosaceae), 45351. **Cojiniquil.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 183a. Finca Chejel, Baja Verapaz, Guatemala. October 15, 1917.)

An indigenous species of Inga common along water courses in the Alta Verapaz, and also planted for shade in coffee plantations. The tree is medium-sized, reaching about 40 feet in height, with a broad open crown and scant foliage. The leaves are large, compound, with 3 or 4 pairs of leaflets. The fruits, which are produced in abundance during September and October, are slender pods about 6 inches in length. They contain 6 to 10 irregularly oblong, dark green seeds, each surrounded by a white, jelly-like pulp of sweet, aromatic flavor, strikingly suggestive of the litchi (*Litchi chinensis*). While the quantity of pulp is not great the flavor is really excellent, and the fruit seems to be popular among the inhabitants of the region. While it is not anticipated that this fruit will ever become of commercial importance in the United States, the species is well worthy of a trial by plant fanciers in Florida for the interest which it possesses."(Popenoe.)

Licoris aurea (Amaryllidaceae) 45526. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1283. Chien ching shan near Kingmen, Hupeh, China. September 21, 1917.) A bulbous plant, flowering in late summer, with large ochreous yellow flowers, borne on stems often over 2 feet tall.



FOUR-YEAR-OLD FEIJOA BUSH AT TALLAHASSEE.

(*Feijoa sellowiana.* See S. P. I. No. 39555.)

The hardiness of this South American fruiting bush is something of a surprise. It promises to grow and fruit as far north as Alabama and Georgia. It appears to be cross-fertilized by birds, which are fond of the thick petals of the flowers. The large-fruited selected varieties of California deserve a trial in the Gulf States. (Photographed by R. A. Young, on the place of Geo. B. Perkins, Tallahassee, Fla., August 12, 1916; P19859FS.)

THE SCENTED MELON OF GUATEMALA.

(*Sicana odorifera.* See S. P. I. No. 43427.)

The melocoton, a peculiar melon found in the Guatemalan lowlands, which, when prepared as a preserve is famous throughout the Republic. The name, *melocoton*, properly belongs to the peach, but has probably been applied to this melon through some resemblance, fancied or otherwise, to the peach. In color the melocoton is either a beautiful deep red or a black; the flesh is yellow, aromatic, with numerous black seeds. The ripe melon has a delightful spicy fragrance. The possibility of hybridizing it with other species of cucurbits should be considered. (Photographed by Wilson Popenoe, Mazatenango, Guatemala, September 23, 1916; P16804FS.)

The foliage dies down in summer but comes up again in early spring or late winter, where the climate is mild. Apparently withstands zero temperatures. Collected in pockets of humus soil beneath tall trees on a rocky mountain slope at an elevation of over 2,000 feet above sea level. May possibly be hardy at Washington, D.C." (Meyer.)

Malus theifera (Malaceae), 45681. From Jamaica Plain, Massachusetts. Presented by the Arnold Arboretum. A small handsome tree with stiff spreading branches, resembling a cherry tree when in bloom. The fragrant flowers are white or light pink with purple calyx, and the young leaves are purplish. The fruit is globose, light greenish yellow with reddish cheek, ripening in Massachusetts in October. The tree is Asiatic in origin, ranging from China to Assam. (Adapted from Rehder, and also Bailey, Standard Cyclopedia of Horticulture, p. 2872.

Pavetta zimmermanniana (Rubiaceae), 45554. From Buitenzorg, Java. Presented by the Director of the Botanic Gardens. A small rubiaceous tree or shrub, with opposite, nearly elliptic leaves and clusters of small, slender-tubed white flowers. "The remarkable researches of Zimmerman and Faber, detailed in the Jahrbücher für Wissenschaftliche Botanik, vol. 51, p. 285, 1912, and vol.54, p.243, 1914, make this species of unusual interest. Faber has proved that the leaves of this and several other species of Pavetta, Psychotria, and possibly other genera of the Rubiaceae contain colonies of a non-motile, nitrogen-fixing bacterium which he names *Myco-bacterium rubiacearum*. The bacteria of this species almost invariably inhabit the micropyle of the young seed and, when the seed germinates, grow through certain stomata of the very young leaves and into the intra-cellular spaces formed in the leaf tissues around these stomata. Cavities are formed through the growth of the epidermal cells which later close entirely and make bacterial nodules which are deeply imbedded in the leaf tissues. A single leaf may have several dozen of these symbiotic bacterial nodules. Faber was able, by treating the seeds with hot water and a solution of sublimate to kill the inhabiting myco-bacteria and, later, to infect part of the seedlings grown from these seeds with pure cultures of the bacterium. The artificially infected seedlings grown in soil free from combined nitrogen, grew well

and remained healthy for 4 months, whereas those not so infected turned yellowish white and died in 3 or 4 weeks. The plants from unsterilized seeds produced leaves bearing many more bacterial nodules than did those from sterilized seeds which were later artificially inoculated. In view of the fact that these rubiaceous plants with bacterial nodule-bearing leaves occur in many parts of the tropics and that in India, at least, the value of their leaves for manure has long been recognized, and considering the value of nitrogen-fixing legumes as fertilizers, the suggestion of Faber that we may have in these tropical trees and shrubs, plants of positive agricultural value for the tropical planter is well worthy of consideration. The value of the mulch formed by the leaves of leguminous and other plants is keenly appreciated by the best cultivators; and it may be possible to find suitable small shrubs of Pavetta and other rubiaceous plants which will be worth while growing for their nitrogen-fixing leaf-bacteria in the orchards of our semitropics or wherever else the climate will permit of their cultivation." (David Fairchild.)

Pogonopus speciosus (Rubiaceae), From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 191. Finca Chejel, Baja Verapaz, Guatemala. October 15, 1917.) A handsome flowering shrub from the valley of the Rio Polochio, near Tucuru, Alta Verapaz. The brilliant scarlet bracts make the plant a striking object among the vegetation along the slopes of the valley, suggesting the poinsettia in color. The plant is bushy in habit, reaching 15 feet in height, the leaves broadly lanceolate, acuminate, 3 to 5 inches long, with margins entire. The flowers are tubular, about 1 inch long, produced in corymbs 2 to 4 inches broad. Many of the flowers are subtended by ovate-acute bracts, 1 to 1½ inches in length, and of brilliant crimson-scarlet color. This species should be tested as an ornamental shrub in Florida and California."(Popenoe.)

Prunus mume (Amygdalaceae), 45523. **Japanese apricot.** From Yokohama, Japan. Purchased from the Yokohama Nursery Company. A tree with somewhat the appearance of the common apricot, but the bark is greenish or gray, and the foliage is duller in color. The leaves are relatively small, long-pointed, lighter colored beneath, and the fragrant flowers are sessile or nearly

so. The yellow or greenish fruit is usually smaller than the fruit of *P. armeniaca*, and the dry flesh adheres to the pitted stone. The tree is a native of Chosen and perhaps of China. It is very valuable as an ornamental, and the double-flowered form was introduced into Europe from Japan in 1878. In late years it has been imported from Japanese nurseries in quantity, and in various forms such as the white, double-white, double-rose, and weeping. The double-flowered form is especially valuable in gardens for its early profuse blooming, being in flower about the same time as the almond, and being, when at its best, almost as beautiful. The fruit is about an inch in diameter, and is used in Japan as a pickle. The fruits are picked just before they are ripe, and soaked in water for 24 hours; then they are mixed with salt and the leaves of the red-leaved variety of *Perilla nankinensis* and allowed to stand a week or less depending on the temperature. After this the fruits are spread in the sun to dry, and while drying are sprinkled with the juice of the Perilla leaves. After 3 to 5 days they are put up in weak brine, and will keep indefinitely. The pickled fruit is exceedingly sour, and often forms a part of the Japanese soldiers' ration. For best results the tree should be grown in a shady place. There are hundreds of distinct varieties grown in Japan for both flowers and fruit. This importation however is of seeds for trial as a stock, there being a possibility that it may prove resistant to crown gall. (Adapted from Bailey, Standard Cyclopedia of Horticulture; Bean, Trees and Shrubs Hardy in the British Isles; and F.N. Meyer, Agricultural Explorer for this Department.)

Pterogyne nitens (Caesalpiniaceae), 45485. **Ybyra ro.** From Porto Murtinho, Matto Grosso, Brazil. Presented by Mr. C. F. Mead. "In many ways, this timber is the most useful found hereabouts, especially for hulls of boats, coach work, etc. You have no timber at all like it. "(Mead.) A tall, stout, unarmed tree, abundant in parts of Argentina and Brazil. The wood is very strong and resistant, and is used in the construction of carts, excepting the spokes. It is considered an excellent wood in Missiones whence it is exported. It is also highly valued in Salta, and is used in coach making. (Adapted from S. Venturi, Contribucion al Conocimiento de los Arboles de la Argentina.)

Ribes fasciculatum chinense (Grossulariaceae), 45689. From Jamaica Plain, Mass. Presented by the Arnold Arboretum. Handsome shrub, native of northern China, growing to 4 feet in height, and chiefly valued for its late persistent foliage, and the bright scarlet berries which remain on the branches during the whole winter. The small greenish flowers are dioecious, and the insipid fruit is sub-globose, scarlet, glabrous and ½ inch across. The subspecies differs from the type in having larger leaves, and the young branches, petioles and leaves pubescent. (Adapted from Bailey, Standard Cyclopoedia of Horticulture. Vol.5, p.2960.)

Rubus trichomallus (Rosaceae), 45356. From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 186aa.) A very interesting species of Rubus which I have seen only in the Verapaz. It is common about Purulá, Tactic and San Cristobal, and I have seen it as far east as Sepacuité. It occurs at elevations of approximately 5,000 to 6,000 feet. There is another wild Rubus in this region which is more common but its fruits are much more seedy and of acid flavor. This plant sends up strong, rather stiff canes sometimes 10 or 15 feet in length. They are covered abundantly with reddish spines, the young branchlets appearing coarsely hairy. The leaves are trifoliate (distinguishable by this means from the other species whose leaves are composed of 5 leaflets), and velvety in texture. The leaflets are ovate-acuminate, about 3 inches long, finely serrate. The flowers which are rather small, are produced in large terminal racemes. The fruits are not as large as in many wild blackberries, being scarcely more than half an inch in length, but they are of delicious flavor, and the seeds are so soft that they are scarcely felt in the mouth. In this latter respect the species is a marked contrast to the others seen in Guatemala, the seeds of wild blackberries being usually very large and hard. The plant bears abundantly, and the sweetness of the fruits makes them very desirable for eating in the fresh state. This Rubus can be strongly recommended for trial in the southern United States." (Popenoe.)

Saccharum officinarum (Poaceae), 45513. **Sugar cane.** From Reduit, Mauritius. Presented by H. A. Tampany, Director, Department of Agriculture. **M.P.55**. A widely grown variety, exceeded only by **White tanna** in area

under cultivation. Twelve per cent of all the land devoted to sugar cane raising is occupied by this variety. In Mauritius this variety seems to prefer the lowlands, two thirds of the area devoted to it being below 600 feet in elevation. The origin of this variety is tracedto Mr. G. Perromat, Manager of the Clemencia Estate, Flacq, who began to grow canes from seed in 1891. **M.P.55** is the best of the varieties he succeeded in raising. (Adapted from Henri Robert, Sugar Cane Varieties in Mauritius.)

Notes on Behavior of Previous Introductions.

In a letter dated July 24, 1918, Mr. Charles E. Adams, of Mountain View, Cal., states:

"*Diospyros kaki*, 26773, bore a few fruits for the first time which were delicious, sweet without the pucker before they were frosted and of fine large size. This year the tree is well filled with fruit."

Mr.John B. Wiggins, of Holly Hill, S.C., writes, August 22, 1918:

"I have noticed the strong, very healthy growth, even during dry periods, of the **Quetta nectarine**, (*Amygdalus persica nectarina*) upon the *Amygdalus davidiana* stocks. The two plants (*Amygdalus persica nectarina*, 34684), sent me by your Office February 29, 1916, have done so well here upon that stock that I should like to use it. The peach borers are very numerous here and it seems that they do not attack the davidiana stocks so readily as they do stocks of other seedling peaches here, though there is not a sufficient number of the davidiana stocks here for a fair test."

Mr .A. D. Shamel, of Riverside, Cal., reports, October 31, 1918;

"Our three Feijoa plants (*Feijoa sellowiana*, 26121,) produced a very large crop this year. On two of them the fruits were the largest that I have ever seen, about the same size as the Harman avocado. We picked about 3 bushels of fruits from the three bushes which are 5 years old. My wife has made up a large quantity of jelly from them, as much as we can use all year. We have used them sliced, like sliced bananas, with sugar and cream. They are delicious in this way. We also made pies - and very good pies - from them. In addition, we have given a bushel of fruit to neighbors who are fond of them." (See Plate 231.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
D. A. Bisset, Miss Bessie Broadbent, L. G. Hoover, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Or pet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. Gustav Eisen, New York City.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 142. FEBRUARY, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Annona	1275	Persea	1278
Aralia	1275	Pyrus	1279
Bursera	1275	Saccharum	1280
Camoensia	1275	Stadmannia	1280
Casuarina	1276	Vanilla	1281
Lansium	1276	Ziziphus	1281
Passiflora	1277		

Plates:

Pl. 233. Fruits of the Soncoya, *Annona purpurea*.
234. A new hybrid Chinese-European Pear.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 2, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Annona cherimola x squamosa (Annonaceae), 45571. **Atemoya.** From Lamao, Bataan, Philippine Islands. Presented by the Director, Bureau of Agriculture, Manila. No.12. This cross has produced a hybrid, the fruit of which is small, and weighs on an average 175 grams, with a length of 65 millimeters and a transverse diameter of 60 millimeters. The shape of the fruit is cordiform, regular, and the carpels end in a more or less pointed protuberance. The surface is green with reddish dots on the sun-exposed side, and is covered by a white bloom. The skin is quite thick and tough. The pulp is white, juicy, sweet, faintly aromatic, and devoid of the cherimoya flavor, but of good quality. (Adapted from Wester, Philippine Agricultural Review, Third Quarter, 1915.)

Aralia chinensis mandshurica (Araliaceae), 45573. From Jamaica Plain, Mass. Presented by the Arnold Arboretum. This is a small hardy tree from Japan, resembling *Aralia spinosa* (Hercules' Club), but it is more treelike, has fewer spines, and does not sucker, which makes it a much more desirable lawn tree. It does not form many branches, but the large bi-pinnate leaves cast a good shade. The greenish white flowers are borne in large panicles, and the berries are dark red when ripe, producing a very pleasing effect. Like all other aralias, this one grows freely from pieces of root. (Adapted from The Florists' Exchange, November 6, 1915.)

Bursera sp. (Burseraceae), 45577. **Copal.** From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No. 218a. Guatemala, Guatemala. November 22, 1917.) One of several species which furnish the. copal gum so extensively used in Guatemala as incense. The burning of this incense in religious ceremonies is a custom which has come down from the earliest times, and is still practiced, mainly by the Indians. The gum is obtained by making incisions in the bark of the tree which is rather small in size and is common in the highlands, both wild and cultivated." (Popenoe.)

Camoensia maxima (Fabaceae), 45608. From Cienfuegos, Cuba. Presented by Mr. R. M. Grey, Harvard Experiment Station. This vine, which adorns the tops of lofty trees in tropical Africa, bears probably one of the largest and most beautiful flowers in the world. It is the largest flowered legume. The deliciously

fragrant flower ,8 to 12 inches in length, has petals of pure white delicately margined with gold which becomes old gold with age; and is borne in pendulous clusters of nearly a dozen individuals each. One drawback to the cultivation of this plant is that it has been extremely slow in coming into bloom, only blooming in hothouses of considerable size. Regarding the possibilities of this plant in the United States, Mr.George W. Oliver, Propagator to the United States Department of Agriculture, states, "Very likely this plant will flower oftener and more profusely in this country than in Europe, particularly England, because of our higher summer temperature, which enables the plant to grow rapidly and ripen its wood." (Adapted from The Garden Magazine, May 1908; Oliver, Flora of Tropical Africa; and C. F. Baker, American Breeders' Magazine Vol. IV. p.213. "The Camoensia vine is growing in rather clayey soil with a reddish rotten-stone subsoil, on a dry situation but gets abundant water during our wet season and is occasionally watered during the winter or dry season, but stands considerable drought without injury. The vine is fully exposed to sun part of the time. It will grow in full sun, also in full shade, but makes more luxuriant foliage where partly shaded. The long branches, 10 to 12 feet, in length, always seek the open before blooming. Flowers are produced several times annually, but seed is produced more freely during the summer. When ripe, the pods split with great force (enough to tear thin cotton cloth with which they are often covered to protect the seed from scattering) and throw the seed 30 feet or more away from the plant. I believe the plant could be acclimatized in the hammocks of southern Florida with but little or no trouble, and the natural distribution of its seeds would cause it to spread rapidly. It would certainly be worthy of trial." (Grey.)

Casuarina sumatrana (Casuarinaceae), 45659. From Buitenzorg, Java. Presented by the Director, Botanic Garden. Introduced as a tree having more style to it than *Casuarina equisetifolia*. It forms a larger and more graceful tree than the latter which, unfortunately, has been so commonly used as a street tree in Florida. Its hardiness will have to be tested." (David Fairchild.)

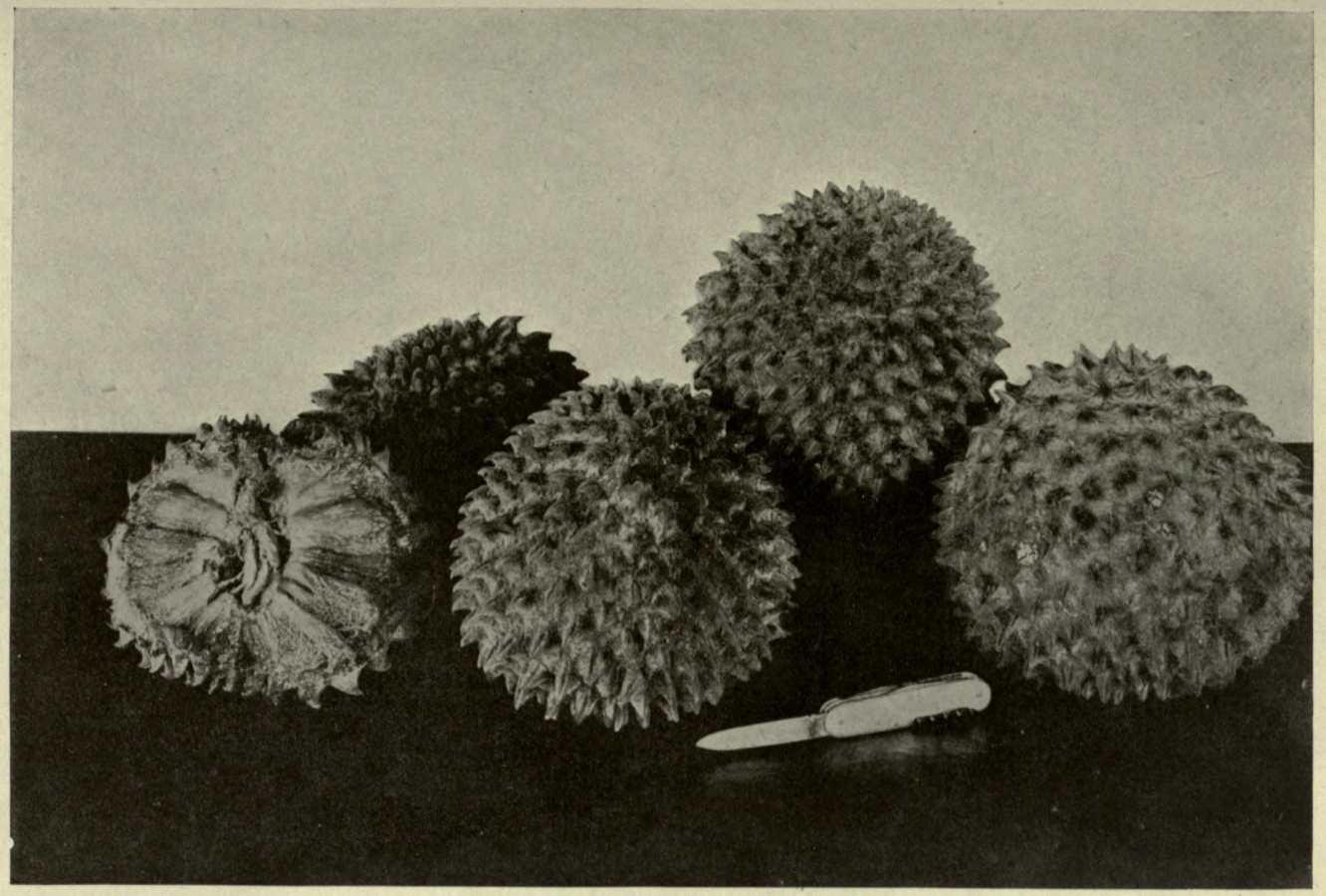
Lansium domesticum (Meliaceae), 45616. **Langsat.** From Manila, Philippine Islands. Presented by

Mr. Adn. Hernandez, Director, Bureau of Agriculture. "This, like the mangosteen, is a delicious Oriental fruit not yet well established in America. While it is not as famous as the mangosteen, it is highly esteemed throughout the Malayan region and is praised by many travelers. Judging from our limited experience with it, the **langsat** is slightly hardier than the mangosteen, and there seems to be no reason why it should not succeed with us. A few plants have been grown in the West Indies and other parts of the American tropics, but I have yet to hear of its fruiting outside the Orient. The **langsat** has two allies in America: one the well-known umbrella tree (*Melia azedarach*) of the United States; the other the tropical mahogany (*Swietenia*). The genus Lansium, to which the **langsat** belongs, is a small one; and is the only one cultivated for its fruit. The duku, a fruit closely resembling the **langsat**, is commonly considered a botanical variety of *L. domesticum*. The tree is rather slender in habit, with a straight trunk and compound leaves composed of 3 or more pairs of elliptic to obovate leaflets 3 or 4 inches in length. The fruits, which ripen in the Straits Settlements from July to September, are produced in small clusters; in general appearance they suggest large loquats, the surface being straw-colored and slightly downy. The skin is thick and leathery and does not adhere to the white translucent flesh which separates into 5 segments. Each segment normally contains an oval seed, but some of the segments in each fruit are usually seedless. The flavor is highly aromatic, at times slightly pungent. The fruit is commonly eaten while fresh but it is said also to be utilized in various other ways. The name **lanzon** is applied to this fruit in the Philippine Islands, **langsat** or **langseh** being the form used in the Malay Peninsula." (Wilson Popenoe.)

Passiflora ligularis (Passifloraceae), 45614. From Caracas, Venezuela. Presented by Mr. H. Pittier. "Unquestionably one of the best of the **granadillas**. In Guatemala it is common at elevations of 4,000 to 7,000 feet, but I have never seen it in the lowlands; it appears therefore, that it is adapted to subtropical climates, and judging from its presence in portions of Guatemala almost too cold for the avocados, I feel that it ought to succeed in California. The behavior of other species, such as *P. edulis*, in that state indicates that conditions in general are favorable to the passifloras, and the question has generally been one

of hardiness. Many species tested in California have proved to be too tender. *P. ligularis*, with slight protection during the first winter or two, certainly ought to thrive in the southern half of the state. "In Guatemala it is a rampant climber, scrambling over trees and buildings, and covering them with a canopy of green. It goes to the tops of trees 35 to 40 feet in height. Its foliage is bold, the large, cordate leaves being as much as 6 or 8 inches in length. The ripening season commences in early fall and extends through the winter. Large plants bear abundantly, yet I have never seen a vine so laden with fruits as some of the plants of *P. edulis* which grow in California gardens. The fruits are commonly $2\frac{1}{2}$ inches in length and deep orange-yellow in color. Sometimes a purple-fruited variety is seen. The brittle outer shell or pericarp, when broken away at one end, exposes the small elliptic seeds individually enclosed in juicy white aril. The aroma of the fruit is delightful; it may properly be termed perfumed. The flavor is equally pleasant, and unlike many other passifloras is not unduly acid. The fruit is commonly eaten out of hand, for which mode of use it seems best adapted. One can consume a large number of them without any ill effects. The fruits are often brought into the markets of Guatemala upon the backs of Indians from distances of 100 miles. The pericarp is so tough that it is not easily bruised, hence the fruit can be transported without difficulty. It is attractive in appearance, and so popular in Guatemala that it realizes higher prices in the markets than the majority of other fruits which compete with it. The term **granadilla** (diminutive from **granada**, Spanish for pomegranate) is applied in tropical America to the fruits of various passifloras. It is an attractive name, and it seems desirable to retain it, but an additional word is necessary to distinguish between the various species. The one under consideration might well be called the **sweet granadilla**." (Wilson Popenoe.)

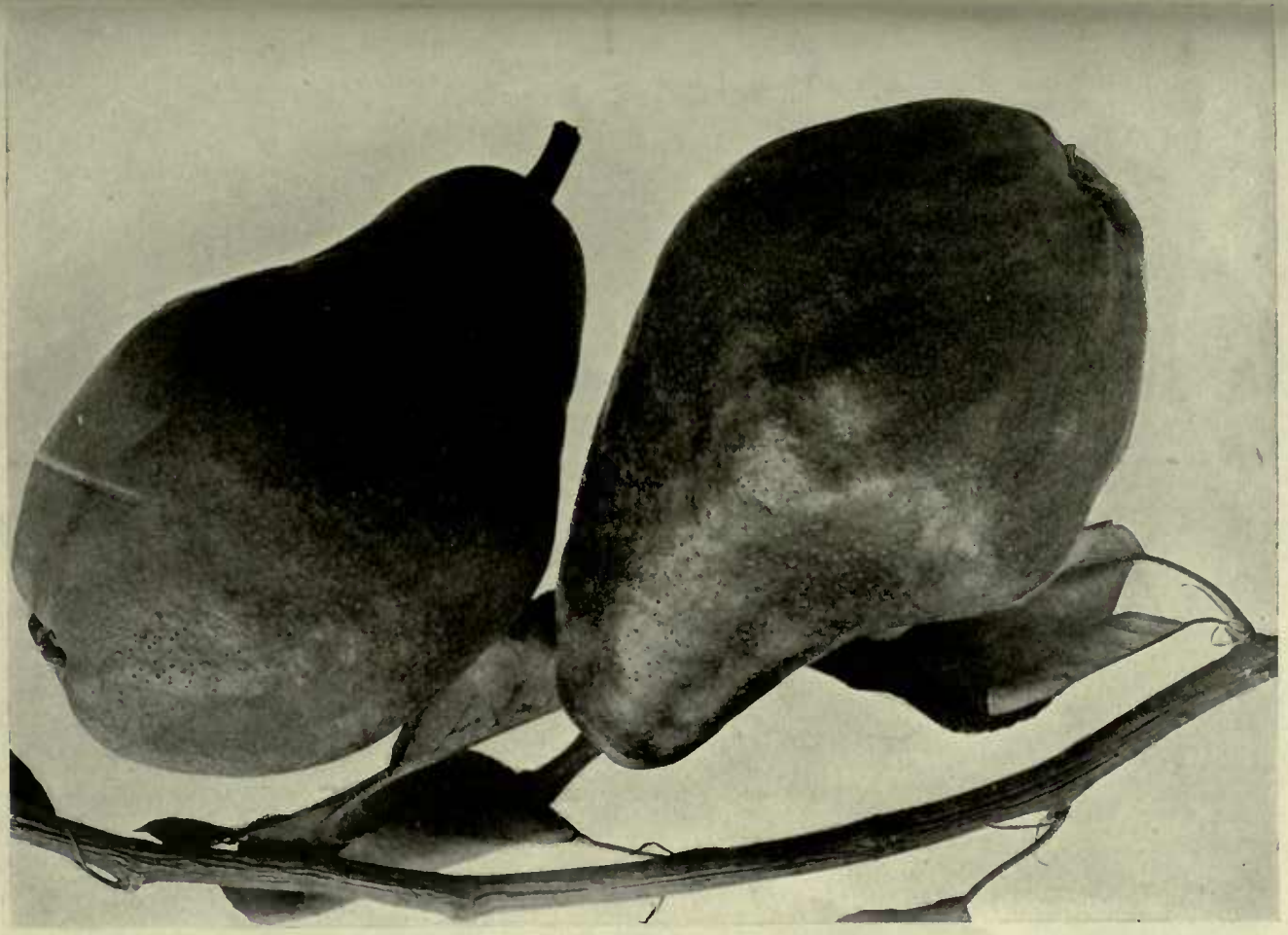
Persea americana (Lauraceae), 45562. **Avocado**. From Guatemala. Collected by Mr. Wilson Popenoe, Agricultural Explorer for this Department. "(No.214. Avocado No. 34. **Ishim**. November 20, 1917.) From the terreno of Ignacio Hernandez, at San Lorenzo del Cubo, near Antigua. While most avocados in the Antigua region do not ripen their fruits until February or March, this one matures its entire crop by the end of November. It can be considered, therefore, a very early variety,



FRUITS OF THE SONCOYA.

(*Annona purpurea.* See S. P. I. No. 43426.)

This immense anona is common in Guatemala, both wild and cultivated. Its prickly fruits are as large as a child's head, often weighing 3 pounds or more. The flesh is bright orange in color and has the flavor of the North American papaw (*Asimina triloba*). It is sometimes avoided by the Guatemalans because of the current belief that it causes malarial fevers. (Photographed by Wilson Popenoe, at Escuintla, Guatemala, September 22, 1916; P16792FS.)



A NEW HYBRID CHINESE-EUROPEAN PEAR.

(See S. P. I. No. 43442.)

The result of a cross made by Dr. Walter Van Fleet at his place in Little Silver, N. J., in 1907, between varieties of the oriental pear (*Pyrus chinensis*) and the European pear (*Pyrus communis*). The exact varietal parentage has been lost. It is an attractive variety, somewhat resembling the Bartlett in appearance, but with a deep red cheek on yellow ground. The flesh is fine grained, tender, and juicy, with but few granules. The flavor is sweet and pleasant, and it may be classed as of very good quality and possibly of value for canning purposes. (Photographed by R. L. Beagles, Plant Introduction Field Station, Chico, Cal., September 14, 1915; P21160FS.)

and as such is worthy of a trial in California, where early varieties of the Guatemalan race are needed. Its only visible defect is its somewhat large seed. The quality is good and the fruit is attractive in appearance. This location is not sufficiently high to experience cold weather, hence the variety must be assumed to be of average hardiness for the Guatemalan race until it can be given a trial in the United States. The productiveness of this variety is somewhat in doubt. The crop harvested in 1917 was not large. The tree bloomed heavily in December and was setting a good crop when last seen. The season of ripening extends from October to the first of December. Probably the fruits would remain on the tree later than December if given an opportunity to do so, but as avocados are very scarce at this season of the year they are picked as soon as mature. The form of the fruits, pear shaped to obovoid, is attractive, as is the deep maroon color which they assume upon ripening. They are of convenient size, about 12 ounces, and the flesh is yellow and of good quality. The seed is larger than in the best late varieties, but not unreasonably large. It is tight in the cavity." (Popenoe.)

Pyrus calleryana (Malaceae), 45592. **Wild pear.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2453a. Kingmen, Hupeh, China. October 1917.) Over 100 pounds of seed of a small-fruited wild pear which has proven to be highly resistant, but not totally immune to fire-blight in the innoculation experiments of Professor F. C. Reimer at Talent, Oregon. This pear grows in a variety of habitats, as at the edges of ponds, in dense thickets, on rocky mountain slopes, in crevices, etc. It is used by the Chinese as a stock for improved pears, and seems to make a good union. When left alone it grows into a large tree reaching an old age. Where this pear occurs around Kingmen, *Pyrus betulaefolia* also is found and, since it resembles *P. calleryana* to a striking degree, it is impossible, when collecting a large number of fruits, to keep it out entirely. There is, therefore a certain percentage of seed of this pear mixed with that of *P. calleryana*. As *P. betulaefolia* is highly susceptible to blight, rogueing in the seed beds or nursery plantings of *P. calleryana* should be carefully done. To insure pure seeds for future stock purposes, groves should be set out here and there, away from other species and varieties of pears, so as to minimize

hybridization, and in localities where spring frosts are of rare occurrence. Where *Pyrus calleryana* occurs wild one finds it associated with the Chinese pistache, the jujube, *Ligustrum lucidum*, *L. quihoui*, *Xylosma racemosum*, *Celtis sinensis*, *Ulmus parvifolia*, *Pinus massoniana*, *Vitex negundo*, *Cudrania tricuspidata*, *Phyllostachys sp.*, *Poncirus trifoliata*, *Zanthoxylum alatum*, etc. In gardens with it, one finds cultivated *Osmanthus fragrans*, *Meratia praecox*, *Paulownia tomentosa*, Ichang lemon, grapefruit, mandarin orange, flowering cherry, raisin tree, loquat and others. The fruits of *Pyrus calleryana* when ripe become soft and assume a brown color, while those of *P. betulaefolia* also become soft and turn quite black. When not soft, however the fruits of the two species cannot be separated when once mixed, unless there are leaves attached to them. Chinese name **Yeh tang li** (Wild crab apple pear)." (Meyer.)

Saccharum officinarum (Poaceae), 45611. **Sugar cane.** From Trinidad, B. W. I. Presented by the St. Clair Experiment Station, Department of Agriculture. **Louisiana 511**, one of the sugar cane seedlings tested in 1908 at the Louisiana Sugar Experiment Station at Audubon Park, New Orleans, is particularly noteworthy because of the unusually high sucrose content (16.3 per cent) for Louisiana conditions. The parent cane was **Trinidad 189**. (From a paper by H. P. Agee, in the Louisiana Bulletin No. 127, May 1911.) "The success of seedling canes raised in Louisiana from imported Trinidad seed may make the reintroduction from that same island of seed produced by the Lousiana selected cane of special interest to sugar cane breeders." (Fairchild.)

Stadmannia oppositifolia (Sapindaceae), 45663. From Port Louis, Mauritius. Presented by Mr. G. Regnard. A large hardwood tree, once frequent in the primeval forests of the island of Mauritius but now becoming scarce, with alternate, pinnate leaves; dense panicles of inconspicuous flowers; and hard, spherical fruits nearly an inch in diameter. (Adapted from Baker, Flora of Mauritius.) The fruits make an excellent jelly, very much like that of the quince. This tree grows in a wild state, and the pulp of its fruit, unless made into a jam or jelly, is only fit to be eaten by monkeys." (Regnard.)

Vanilla pompona (Orchidaceae), 45669. From Zacuapam, Vera Cruz, Mexico. Presented by Dr. C. A. Purpus. "Wild vanilla which grows in brush-woods, and half-shady places in the low country at the limit of the Tierra caliente. Should be planted at the foot of small trees or large shrubs in leaf mold." (Purpus.) "A native of Mexico, yielding an inferior quality of vanilla known by the name of 'Vanillon' and 'Vanilloes'. This is claimed to have advantages over proper vanilla, its pods not having a tendency to split, as well as being easily cured, whilst the vines are said to flower and fruit 3 or 4 times during the year." (MacMillan, Tropical Gardening and Planting.)

Ziziphus mauritiana (Rhamnaceae), 45625 to 45658. From Port Louis, Mauritius. Presented by Mr. G. Regnard. "If the Ziziphus trees are not cultivated in the strict sense of the word, they are, however, found in large numbers in the villages inhabited by Indians and Africans, in the warmer localities of the island, and the fruits are well appreciated not only by those people, but also by Europeans and they are sold in great quantities in the fruit markets during June, July and August (the cold season). On having fruits gathered from different trees, I have noticed that there are many varieties, probably more than one hundred, of different size, shape, taste and color. The fruits on ripening may be green, pink, red or yellow. The majority is of a certain shade of yellow. When over-ripe, that is when the fruit softens all the fruits have the same uniform yellowish-brown color. The fruits are eaten before they become what I call, "over-ripe", and except for some varieties have a very good taste. Usually those fruits which have the lower extremity slightly pointed are considered to be the best, but this is not always the case. The tree rarely attains more than 20 feet in height, with a trunk 6 to 8 inches in diameter. It grows all around the island, from the sea level to 500 to 600 feet elevation, but it appears, with a few exceptions, that the best products are obtained from the regions where the heat is more regular, because they are sheltered from the winds which blow during most of the year from the southeast." (Regnard.)

OBITUARY.

Frank N. Meyer, the Agricultural Explorer of China and Turkestan, is dead. The following cablegrams received through the State Department from the American Consul in Nanking contain all the information which we now have about his death - perhaps they are all we shall ever know about the last hours of this remarkable man:

"June 4, 1918.

"Frank Meyer, Department Agriculture, disappeared from a steamer in this consular district en route Hankow to Shanghai, June 2nd."

"June 7, 1918.

"Yours June fifth. Proceeding with Chinese up river to search for Meyer. Steamer captain states Meyer normal but complained of headache. Have telegraphed Legation and requested Swingle come to Nanking to assist in search."

"June 9, 1918.

"Found Meyer's body thirty miles above Wuhu."

Mr. Meyer had endeared himself to all those who came to know him, because of his real interest not only in plants but in the building up of the human race and the work of making the world more beautiful for that race to live in.

It is hard to realize that those facinating letters from dusty inns, Buddhist temples and river steamers will cease. We shall receive no more of the characteristic cloth packages addressed always in his own handwriting and containing carefully packed and carefully labelled packets of seeds or cuttings. Unlike the work of most travelers, whose stories cease with the writing of a book of travel, Frank Meyer's work had a concreteness about it which the making of books can never quite approach; for the things which he brought us are scattered all over this country, and other countries as well, - growing into avenues, orchards, forests, hedgerows, broad cultivated fields and flowering borders, and thousands of men and women own them and appreciate them and some will perhaps make a living out of them.

It is when I think of the rare pleasures which were in store for Meyer in the evening of his life, watching these plants of his become more important every year, that the tragedy of his early death seems keenest. He might have wandered under avenues of his Chinese pistache, or rested under the shade of his dry-land elm, or strolled through orchards of his Fei tcheng peach; the earliest ripening cherries in America he might have picked from trees in this country grown from scions he secured in Tangsi, and he might have gathered hardy walnuts from his Manchurian walnut trees, or sweet chestnuts from his blight resistant chestnut trees: he might have eaten candied Chinese haws, or bought in our markets delicious Chinese jujubes grown in large orchards in California and our Southwest. How each industry, each successful introduction would have brought to his mind the incidents of its discovery and given him a thrill of satisfaction over a difficult work which was destined to enrich the horticulture of the whole world!

But there is another side than that of the personal loss which we all feel on reading the brief cables that, flashed around the world, tell of the ending of Meyer's work. It is the realization of the greatness of the loss to the horticultural world.

It was in the work of ferreting out the details of the culture and proper handling of the thousands of his introductions that Meyer excelled, and now all this gathered plant lore from which we had expected to draw in years to come is gone. His notes were remarkable characterizations of the uses and cultural requirements of the plants he studied, and are in themselves distinct contributions to the horticultural literature of today; but they are very little compared to what he could have told us himself.

Frank N. Meyer was born in Amsterdam, Holland, and from boyhood he showed a love of plants and a lust for travel. He used to tell us how he walked over the Alps into Italy to see the orange groves there and then walked back again. For several years he was the Assistant in the Amsterdam Botanical Garden and was closely associated with Hugo de Vries during the years when the latter was writing his book on Mutations. Coming to America with letters from Professor de Vries and from the Dutch poet Van Eden, he began working in the greenhouses of the Department. His craving for travel caused him, however, to wander to California, and through Mexico and back on foot; later

he found his way to the Shaw Botanical Gardens in St. Louis. It was here that the Department found him when, after months of search after the right man to send to explore China, it had almost despaired of finding anyone who combined an insatiable thirst for travel and the ability to walk long distances over trails and across country, with an extensive acquaintance with wild plants, a good knowledge of horticulture, and an absorbing and sustaining interest in the work of plant introduction.

Meyer came into the Office of Foreign Seed and Plant Introduction in July, 1905, and was sent almost immediately to China, where he spent three years. Upon his return he spent one year in America and then went out to Chinese Turkestan, where he traveled for three more years and again returned to America. His third trip was into northwestern China and to the borders of Tibet, and he was gone on this trip three years. After another year spent in America, he again returned to China in 1916 and had nearly completed his second year there when death overtook him.

He introduced during these years of collecting over 2,000 species and varieties of plants; and these are in the main described in the Inventories of the Office. There are on file thousands of record cards which give exact data as to the whereabouts and behavior of the plants which he brought in as seeds or cuttings.

Meyer's field work is done, and whether his body rests beside the great river of China or under some of the trees he loved and brought to this country will matter little to him. He will know that throughout his adopted land there will always be his own plants, - hundreds of them, - on mountain sides, in valleys, in fields, in the backyards and orchards of little cottages, on street corners, and in the arboreta of wealthy lovers of plants. And wherever they are they will all be his.

David Fairchild

The following letter was the last received from Mr. Meyer; and since it is so characteristic and contains so much information on the agricultural situation, it was felt that our cooperators would be interested:

"At last I have been able to break through the lines around Ichang and walked to Kingman, got the stored seeds and baggage there and settled the payments for the pear seeds; then we marched down to Shasi and took a steamer from there and arrived here on the 15th. We were held up a few times and some unpleasantries were indulged in, but on the whole we could have fared far worse. Of course we passed through villages that had been looted and burned and food was hard to obtain, but to an old hand out here, like myself, these things have so often been encountered that one is used to them.

"I did not write you from Ichang of late, because I was not sure that I really could make the trip. The whole country is so fearfully upset that travel has become a perfect gamble. Sometimes travelers get through, but often they have been held up for days and weeks. From Ichang westward all traffic is stopped and products from Szechuan do not come through any longer for months and months. The losses the people at large suffer must be gigantic; right now tung-oil does not reach Hankow any longer, neither do hides, drugs, silks, etc.

"Well, personally I am awfully glad that I got away from Ichang; the situation began to depress me. One cannot live for months in an atmosphere of suspension without feeling the effects. And as I had cheerless, uncomfortable quarters and lack of substantial food at times, one had both mental and physical discomforts.

"Well, I just received your very sympathetic letter of February 26. Uncontrollable forces seem to be at work among humanity, and final results, or possibly purposes, are not being revealed as yet, that is, for so far as I can look into this whole titanic cataclysm.

"Now concerning my own plans, of which you want an outline by about the first of July - well, I can say this, that my ideas are to leave here within a day or two, visit Kiukiang for tung-oil plantations which have been set out nearby, then go down to Nanking possibly, and from there to Shanghai, where I may stay

many weeks, shipping off seeds and specimens. Then when the heat gets too intense, I may move up to some quiet place on the coast of Shantung and work up the herbarium specimens I have collected these past 18 months. When chestnuts commence to come in by the end of September or early October, I may purchase several hundreds of pounds and ship them, and possibly seeds of *Pyrus ussuriensis* might be brought to us. I shall now try to answer various items which your many letters contain:-

"Your item of putting 300 acres in soy beans at Yarrow interests me greatly. It shows how food supplies slowly crowd out mere ornamental propositions.

"Concerning my giving you a careful analysis of Chinese food situations - Well, as you realize, China is a big land and feeding the multitudes presents problems that are at times purely local. As a whole, however, I can say that from my personal observations I can testify that here in Central China, rice forms three-fourths of the total amount of food the ordinary people take in; meat and fish supply a mere fraction and the rest is taken in the form of beans, peas, lotus-rhizomes, various roots and tubers and in leafy vegetables, the last in bulk often looking predominant, but being only coarse matter, really amount to a small percentage of the total.

"Concerning Dr. McCollum's idea that leafy green vegetables are essential in the human diet, well, this is a mooted question. The Russians at large use but few leafy herbs and thousands of cowboys, especially in the Argentine, live on an almost pure meat diet. Of all the leafy greens, the Chinese love especially those belonging to the cabbage and mustard group; it seems that the race has found out that they supply some essential factors. Spinach also is in great demand but it is a much dearer vegetable than various cabbages.

"Concerning Chinese substitutes for dairy products, well, the 101 different manufactures of the soy bean supply this protein, but I must admit that it will take some time for the white races to acquire a taste for the very large majority of these products. We are still at it, but being without an interpreter I don't find out as much as I would like.

"I am glad to notice your statement regarding the Feitcheng peach. And having come true from seed certainly surprises me.

"Concerning curd made from acorns, I have not come across it yet; it seems to be rather a country product.

"Concerning obtaining quantities of *Davidia involucrata*, it seems that the tree is especially abundant south of Patung, but with all the fighting going on there no one knows what time a collector could travel in that district.

"Concerning similarity of fruits of *Pyrus calleryana* and *P. betulaefolia*, well, that has been some problem. I found out that the first, when fully ripe, turns into a brown color and the last becomes black. However, when natives bring in several thousands of pounds of fruits and not all entirely ripe then you may realize what a job we had in trying to separate the two kinds.

"Growing Chinese yams for flour production in America; well, the digging of yams is a very laborious process and right here they are really in the nature of a luxury. This whole hunting for new food products is really a trying situation. So much experimenting is needed to establish a new crop that often a person's whole life might have to be devoted to it.

"I think that soy bean flour might come to the front and all sorts of beans should be tried, especially in the Southern States.

"Your very sympathetic remarks are surely appreciated by me. Times certainly are sad and mad and from a scientific point of view so utterly unnecessary.

"Well, later on I'll answer more correspondence from you and from others in our Office.

"With kindest regards to you all, I remain,

"Very sincerely yours,"

(Signed) Frank N. Meyer.

c/o American Legation, Peking, China.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
Wilson Popenoe, Agricultural Explorer.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
D. A. Bisset, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 143. MARCH, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1291	Myrciaria	1294
Cephaelis	1291	Oryza	1295
Chenopodium	1291, 1292	Pterocarpus	1296
Coix	1292	Rosa	1296
Colocasia	1292	Solanum	1296
Dodonaea	1293	Stryphnodendron	1296
Elaeis	1293	Tutcheria	1297
Holcus	1293	Vitis	1297
Kennedya	1293, 1294		

Plates:

Pl. 235. A hardy relative of the Cherimola, *Rollinia emarginata.*

236. The effect of a freeze on Papaya fruits.

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 18, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia spherocephala (Mimosaceae), 45792. **Bull-horn Acacia.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. One of a group of acacias remarkable for their large, stipular, inflated spines which closely resemble the horns of a buffalo. This particular species is a shrub or small tree. The leaves are bipinnate, and have remarkable glands, rich in oil, on the rachis and leaflets. The thorns are utilized by certain stinging ants of the genus *Pseudomyrna* as nesting places for their young. The thorns which are connate at the base, are hollowed out by the insects, which perforate one of the spines near the tip, so that no water can enter. Belt suggests that in return for quarters and subsistence on the minute wax-like bodies on the leaflets, the little ants serve their host as a body-guard of soldiers. Jacquin in describing a bullhorn acacia growing near Cartagena, (Colombia) in 1763, tells how the little insects rush from the thorns when the tree is struck however lightly, falling upon the unwary intruder and inflicting upon him myriads of burning stings. The flowers are borne in globose heads on long thick peduncles, clustered in the axils of the long forklike spines. The seeds when ripe are surrounded by a sweetish yellow or orange-colored pulp which causes the fallen pods to be eagerly sought after by pigs and other animals. (Adapted from Safford in Bailey's Standard Cyclopedia of Horticulture, p. 598.)

Cephaelis sp. (Rubiaceae), 45730. **Raicilla** or **Ipecacuana.** From Panama, R. P. Presented by Mr. Ramon Arias-Feraud. "A small shrub belonging to the Rubiaceae, 8 to 16 inches high with ascending or erect simple stem and somewhat creeping root. It is one of the sources of the medicinal **Ipecacuana.** The typical plant grows in Peru, but specimens of closely allied or identical species from Central America are in the economic collection of the United States Department of Agriculture." (W. E. Safford.)

Chenopodium sp. (Chenopodiaceae), 45722. From Mexico. Presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico City. "Native name, **Tililhuauhtli,** 'Black huauhtli'. A plant used by the Mexicans as a potherb, possibly the original form from which the pale-seeded **xochihuauhtli** has been developed by cultivation. Like the latter, the immature inflorescence (**huauhtzontli,** or huauhtli-heads) is used for food. The seeds of this

variety, discoid in form with the periphery crenated, resemble very closely those of *Chenopodium album* and *Chenopodium paganum*. The plant should not be confused with the common forms of Amaranthus which are used when young by the Mexicans as potherbs, and which have jet black, very highly polished seeds." (W. E. Safford.)

Chenopodium quilitl (Chenopodiaceae), 45721. From Mexico. Presented by Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico City. "Native name, **Xochuauhtli**, 'Flowering huauhtli'. A plant cultivated near the city of Mexico for the sake of its prolific branching inflorescences, which are gathered before they are quite mature and while the seeds are still soft. They are cooked with other ingredients as a vegetable. This variety, with yellowish or pale brown discoid seeds, is the most popular. The inflorescences are known by the Aztec name **huauhtzontli**, signifying 'huauhtli heads'. Botanically the plant is closely allied to *Chenopodium paganum*, and *Chenopodium album*. It is quite distinct from *Chenopodium quinoa*, the celebrated food-staple of the Peruvian highlands; and it must not be confused with the plant called **michihuauhtli**, 'fish-egg huauhtli', which is a white-seeded Amaranthus, not a Chenopodium." (W. E. Safford.)

Coix lacryma-jobi ma yuen (Poaceae), 45767. **Job's tears.** From Soochow, China. Presented by Prof. N. Gist Gee, Soochow University. This variety might be called the cultivated edible **Job's tears**, and includes many forms, all of which are characterized by having a thin, loose, easily broken shell. They are often longitudinally striated, and in many examples are constricted at the base into what is called an annulus. In the central provinces of India, among the aboriginal tribes, this grain forms an important article of food. In Japan, where the plant has been introduced, the seeds are pounded in a mortar and eaten as meal. (Adapted from the Agricultural Ledger, No. 13, p. 217-225, 1904.)

Colocasia esculenta (Araceae), 45779. **Taro.** From Sienkii, Chekiang, China. Presented by Mrs. M. M. Loosley. "**Ts'ing yii**, or blue yii, is a little bluish on the point and stalks, and has a large leaf. This variety also cooks mealy, but is said to be better to eat after a few months keeping. It keeps well." (Loosely.)

A HARDY RELATIVE OF THE CHERIMOLA.

(*Rollinia emarginata*, S. P. I. Nos. 25528, 27610, and 28135.)

The class of plants to which the sugar-apple and cherimola belong is notably tender, and one of the great hindrances to its extensive cultivation in California and Florida lies in its susceptibility to frost. The young tree, the photograph of which is here shown, is standing in the test orchard at Buena Vista, Fla., and although all the species and varieties of Annona and Rollinia standing near it were killed back by the freeze (+26° F.), this specimen remained untouched and is producing new young leaves. According to T. R. Gwynn, of Paraguay, it is a small bush there, but grows on almost any kind of soil and produces large fruit of "the best class of all." (Photographed by David Fairchild, February 23, 1917, at Buena Vista, Fla.; P20454FS.)

Pl. 236.

THE EFFECT OF A FREEZE ON PAPAYA FRUITS.

The Florida freeze of February 3, 1917, occurred early in the morning, the temperature dropping to +26.5° F. just before sunrise. Almost immediately the green papaya fruits became studded with drops of coagulated papain which issued by the thousand from breaks in the thin skin. The photograph here reproduced was taken at about 10 o'clock on the morning of the freeze. Few plants would appear to be more ideal for use than this papaya (*Carica papaya*) in the studies which are urgently needed into the physiology of death by freezing. (Photographed by David Fairchild at Miami, Fla., February 3, 1917; P20390FS.)

Dodonaea viscosa (Sapindaceae), 45726. From Giza, Cairo, Egypt. Presented by Mr. F. G. Walsingham, Horticultural Section, Ministry of Agriculture. "A very interesting hedge plant, beautifully dense and green, responds to the shears perfectly, and when taken in hand early makes a perfectly compact wall clear to the ground. The seedling plants form a rather deep taproot, and must be transplanted with some care on that account. This is one of the most perfect tropical hedge plants I have ever seen. The shrub is called **tattas** by the natives." (Prof. S. C. Mason.)

Elaeis guineensis (Phoenicaceae), 45766. **Oil palm.** From Buitenzorg, Java. Presented by Mr. P. J. S. Cramer, Chief, Plant Breeding Station. This palm is very important economically. The fruit is used by the natives for food; an intoxicating drink is made from the juice of the stem; the leaf stalks and leaves are used for thatching the native houses; and the fruit kernels yield the well-known palm-oil, or kernel oil, of commerce. It is a native of west tropical Africa and occurs over immense areas both wild and in cultivation. (Adapted from MacMillan, Handbook of Tropical Gardening and Planting. p. 538.)

Holcus sorghum sudanensis (Poaceae), 45773. **Sudan grass.** From Cairo, Egypt. Presented by Mr. W. Carl McQuiston. Introduced about ten years ago, this grass has become very popular as a forage crop. It is easily cured, as easily handled as hay, and very drought resistant. It is much superior to ordinary sorghum in the above qualities; in yield, drought resistance, and palatability it appears distinctly to outclass Johnson grass. It does best in the south, but has been grown in some of the northern states. Probably best adapted to the drier portions of Texas, Oklahoma and Kansas. **Sudan grass** seems well adapted for growing with cowpeas for hay and silage. (Adapted from R. A. Oakley, Yearbook of the Department of Agriculture for 1912. p. 495.)

Kennedya monophylla (Fagaceae), 45790. From Summer Hill, New South Wales, Australia. Presented by Mr. Hugh Dixson. Grows well in my garden which is rather stiff soil. Should stand 10 degrees F. if not continuous. *Kennedya monophylla* is a mass of royal blue when in flower. It is better to cut it half back after flowering or after the seed is ripe. It does

well in a sunny hedge, untrimmed in winter." (Dixson.) A climbing plant with solitary, ovate or lanceolate, coriaceous, strongly reticulate leaflets, which are two to four inches in length. The numerous flowers occur in pairs or rarely three together on pedicels rather longer than the calyx. Native of Queensland, New South Wales, Victoria, Tasmania, and South Australia. (Adapted from Bentham, Flora Australiensis, vol. 2, p. 246.)

Kennedya nigricans (Fabaceae), 45791. From Summer Hill, New South Wales, Australia. Presented by Mr. Hugh Dixson. "*Kennedya nigricans* grows well in my garden which has a rather stiff soil. Will stand 10 degrees F. if not continuous." (Dixson.) A large twining plant usually somewhat pubescent. The broadly ovate leaflets are two to three inches long, and very often only one to each leaf. The deep violet-purple flowers are about 1 inch in length, and are borne in racemes which are shorter than the leaves. The flattened pod is glabrous or slightly pubescent. Habitat, Western Australia. (Adapted from Bentham, Flora Australiensis, vol. 2, p. 249.)

Myrciaria cauliflora (Myrtaceae), 45750. **Jaboticaba.** From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. "One of the best indigenous fruits of Brazil, and at the same time one of the most curious and interesting, due to its habit of producing its fruits directly upon the trunk and larger branches. Several species are grown under the name of **jaboticaba** and they are still somewhat confused botanically, but it appears that most of the plants common in cultivation belong either to *M. cauliflora* or *M. jaboticaba*, fruits of the latter being distinguishable from those of the former by the presence of a slender stem. The **jaboticaba** occurs in in southern Brazil both wild and cultivated. It is a very handsome tree, reaching a height of 35 or 40 feet, with a dense dome-shaped crown. The leaves are small, lanceolate, light green in color; flowers white, with four petals and a conspicuous tuft of stamens. The fruits are produced in the greatest abundance, and are the size of large grapes, with a tough, leathery skin, white, juicy pulp of rather acid, aromatic flavor, and 2 to 4 flattened oval seeds. The resemblance between the **jaboticaba** and some of the grapes of the Muscadine group, e.g. **James**, is very striking, not

only in the general appearance of the fruit, but also in flavor. The **jaboticaba** prefers a soil that is rich and deep, and is rather slow of growth, coming into bearing after 6 or 8 years. It withstands slight frosts, and gives promise of being successful in South Florida, and perhaps also in sheltered locations throughout Southern California. At the present time seed propagation is the only means of multiplication which is commonly employed, but inarching or some other means of propagation should be utilized to perpetuate good varieties." (Wilson Popenoe.) "The **jaboticaba** in South Florida was not killed by a temperature of + 26° F. and appears to be semihardy at least." (Fairchild.)

Oryza barthii (Poaceae), 45717. From Algiers, Algeria. Presented by Dr. L. Trabut. An interesting African species, used both for human food and for forage. In habit it differs markedly from the cultivated rices, throwing out rootstocks to a length of several decimeters, with scattering stems rising from them. The foliage remains green for 2 or 3 months, and converts many swampy lands into excellent pastures. The stems rise to a height of 1 to 1.5 meters, even more in deep water. The panicle is short; and the ripe grain, which is small, falls out of the husk very easily. For this reason it is impossible to cut the heads for thrashing without losing most of the grain. To obviate this difficulty, the aborigines, in those regions where the plant is common, paddle among the ripe grain in their canoes, shaking the panicles over a small calabash or basket held in one hand. Most of the grain falls into the basket and is saved. If it is late in the season, the ripe grain will float on the surface of the water, and that which falls outside of the basket may be recovered. This species is not cultivated; and in fact, the grain has very limited use, due to the difficulty of harvesting it. It is sold at a very high price, however, and is considered a product of unusually choice quality. The grain is not so important, from an economic standpoint, as the forage which the plant furnishes. It is considered one of the very best forages of West Africa. (Adapted from Chevalier in Bulletin du Museum National D'Histoire Naturelle, No. 7, pp. 406-407, 1910.)

Pterocarpus indicus (Fabaceae), 45719. **Padouk.** From Hongkong, China. Presented by Mr. W. J. Tutcher, Botanical and Forestry Department. A tall tree with ascending glabrous branches; leaves compound, 6 to 9 inches long, leaflets 2 to 4 inches long; flowers yellowish, in large terminal or axillary panicles; pod orbicular, 2 inches broad. Distributed throughout the Malay Archipelago, Philippines, and China. (Adapted from Hooker, Flora of British India, vol 2, p. 239. Macmillan, in Handbook of Tropical Gardening and Planting, lists this tree as a shade tree suitable for low moist regions (annual rainfall 70 inches or more). He also lists it as a valuable timber tree.

Rosa helenae (Rosaceae), 45729. **Rose.** From Jamaica Plain, Mass. Presented by the Arnold Arboretum. "*Rosa helenae* is very abundant in rocky places from river-level to 1,500 m., everywhere in western Hupeh and eastern Szechwan, but has not yet been reported from farther west. It forms, in wayside thickets and by the banks of streams, tangled masses often 6 m. tall and as much through, and in the margins of woods it rambles over small trees. When covered with masses of its white fragrant flowers this rose is very beautiful. It has proved quite hardy and has flowered profusely at the Arnold Arboretum." (Plantae Wilsonianae, vol. 2, part 2, p. 311.)

Solanum bullatum (Solanaceae), 45751. From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. **Capoeira branca.** An interesting plant which grows on the rolling prairies of the state of Minas Geraes, Brazil, and which is said to have unusual value as a feed for live stock, especially horses. Analyses made by the Bureau of Chemistry, United States Department of Agriculture show that this plant contains an unusual quantity of protein. The analyses follow.

	Leaves	Branches
Moisture	8.36 per cent	7.04 per cent
Ether extract	2.29 " "	0.59 " "
Protein	20.88 " "	14.06 " "
Crude fiber	28.03 " "	37.45 " "

Stryphnodendron barbatimam (Mimosaceae), 45752. From Lavras, Minas Geraes, Brazil. Presented by Mr. B. H. Hunnicutt, Director da Escola Agricola de Lavras. A

small leguminous tree which occurs commonly on the plains of the state of Minas Geraes, and is said by Pio Correa to be distributed from Para, in northern Brazil, to Sao Paulo in the southern part of the country. The bark contains a high percentage of tannin, and is known as **casca da virgindade**; the seeds are said to be poisonous, and the leaves to have medicinal qualities. It is the bark, however, that seems to have economic interest, being considered of value for use in tanning. According to Brazilian authorities it contains as high as 40 per cent of tannin; an analysis made by the Bureau of Chemistry, United States Department of Agriculture, gave the following results:

Total dissolved solids	31.6 per cent
Soluble solids in cold water	28.6 " "
Non-tannins	6.7 " "
Tannins	20.1 " "

Tutcheria spectabilis (Theaceae), 45720. From Hongkong, China. Presented by Mr. W. J. Tutcher, Botanical and Forestry Department. A handsome, ornamental, small tree or shrub, indigenous to the island of Hongkong. The leaves are alternate, short-petioled, coriaceous and shining. The flowers are about 2½ inches in diameter usually having 7 white, roundish-obovate petals. Fruit is a woody capsule, the size of a small apple, retaining at the base the persistent sepals, and containing several large seeds. The plant flowers in May and fruits in November. (Adapted from Champion, Transactions of the Linnean Society vol. 21, p. 111, 1850.)

Vitis tiliaefolia (Vitaceae), 45797. **Grape.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. "A small-fruited wild grape excellent for jelly. This is essentially a tropical grape." (Purpus.) A grape which is widely distributed in the American tropics. It varies greatly and often runs into white-leaved forms. The cluster of fruit is long and long-peduncled, large and compound; the purple berries are small and globose. This species is considered promising as a pomological grape for the tropics. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 6, p. 3489.)

THE PROBLEM OF STOCKS FOR AMERICAN FRUIT GROWERS.

By B. T. Galloway.

For a good many years the Office of Foreign Seed and Plant Introduction of the Department of Agriculture has been engaged in bringing in plant material that gave promise of value for stocks. Special attention has been given to fruit stocks, particularly stocks for the apple, pear, peach, apricot and plum. Since 1898 something over 400 types of pears have been introduced and disseminated. Many types of peach and plum have also been introduced and have been placed in the hands of specialists and others for work in connection with securing disease and insect resistance, soil and climatic adaptability, and congeniality.

Recently the Federal Horticultural Board announced a proposed quarantine on nursery stock and other plants and seeds imported into the United States. On and after June 1, 1919, all plants and plant materials will be excluded except two groups one of which will be admitted without restrictions and regulations and the other with restrictions and regulations. Fruits, vegetables, cereals, and other plant products imported for medicinal, food, or manufacturing purposes; and field, flower, and vegetable seed will have unrestricted entry,- unless on account of some dangerous disease or insect, when there may be issued either a temporary or permanent quarantine. It is conceivable, for example, that there might be a disease affecting the lemon in a foreign country which would make it necessary to quarantine against that country. The Federal Horticultural Board has issued a number of these special quarantines and will no doubt continue to issue them in cases of emergency.

PLANTS ADMITTED UNDER RESTRICTIONS.

The plants and plant materials that will be allowed to come in under restrictions and regulations are lily bulbs, lily of the valley, narcissus, hyacinths, tulips, and crocus. In case any of these materials are packed in sand or soil, the sand or soil must previously be sterilized by heat in a manner satisfactory to the Board. Seedling fruit stocks, cuttings, scions, and buds of fruits for propagating will also be admitted under regulations, together

with rose stocks for propagation. All nuts, including palm seeds, will be admitted, as well as seeds of fruit, forest, ornamental, and shade trees, together with seeds of deciduous and evergreen ornamental shrubs, and seeds of hardy perennial plants.

PLANTS EXCLUDED.

The groups that will be automatically excluded, include such things as budded and grafted fruit trees; grape vines; bush fruits; forest and ornamental deciduous trees; ornamental deciduous shrubs; coniferous trees, including pines; evergreen trees and shrubs, including the broad leaf types; and a considerable list of what is commonly known as field-grown florist's stock.

ADMISSION OF NEW AND RARE PLANTS AND NOVELTIES.

The Board makes provision for the importation, through the Office of Foreign Seed and Plant Introduction in the Department of Agriculture, of new plants, seeds, bulbs, etc., for experimental and scientific purposes and for propagation in this country. The Board also makes provision for the importation in limited numbers of novelties from all parts of the world under safeguards that will assure their freedom from dangerous diseases and insects.

The machinery for this work is already organized in the Office of Foreign Seed and Plant Introduction; and, while it will not be practicable to undertake large commercial importations for private firms, it will be within the province of the Office to handle the necessary limited shipments of novelties that may be brought in for propagation here. While lily bulbs, narcissus, hyacinths, and related bulbs, fruit stocks, and rose stocks will be admitted under regulations, it will doubtless be the policy of the Federal Horticultural Board to exclude these plant materials when it would seem assured that the commercial needs of the country can be met by home grown supplies.

THE PROBLEM OF STOCKS.

The Office of Foreign Seed and Plant Introduction is primarily interested in the broader constructive problems of stock production in this country, and in the securing of types of stocks for the principal

fruit crops and for some of our more important ornamentals like the rose. It recognizes that the whole question of stocks is a broad and complex one and that much work will need to be done to secure light on the many questions involved. We are beginning to appreciate more and more that our future successful fruit culture is intimately associated with the problem of stocks. With the exception of the grape, no far-reaching studies have been made on stocks in this or any other country. We have followed certain empirical practices in the past, but as competition becomes greater and the demand for the highest grades of fruits and plant products increases, we must know more of the actual relation of stocks to quality of product, to the length of life of the tree or plant, to adaptability to soil and climate, to resistance to disease and insect attacks.

The question of stocks would seem to resolve itself into two main groups of problems: (1) The practicability of producing in this country the millions of ordinary apple, pear, plum, and cherry stocks which hitherto have been largely secured abroad. (2) The systematic study of stocks with a view to their improvement and their better adaptability to the wide variety of conditions and needs that exist here and are likely to develop in the future as our great fruit industries become more complex. It is imperative that if our fruit industries are to be maintained, there must be full supplies of the usual or ordinary stocks. The securing of special stocks is a long time process and will have to proceed slowly and carefully, building up cantiously on the foundations we already have and must maintain.

Pear growing is not one of our paramount fruit industries, yet it is safe to say with no other fruit is there a greater proportion of trees lost each year which must be replaced if normal production is to be maintained. Fire blight is the chief cause of the lose of pear trees in this country, and while it is highly desirable to find stocks, or to develop stocks, that may in a measure prevent some of the losses to pear growers from fire blight, the pressing need is to maintain the supplies of French and Japanese seedlings required to keep the number of trees up to normal. If stocks are to be produced in this country to take the place of those hitherto secured abroad, it would seem proper that efforts should be made by the Government to aid those who are anxious to know where

the work can best be done and how it may be done to the best advantage. The problems involved are so complex that private interests can not well handle them.

Briefly then, the chief problems connected with the production of commercial stocks of apple, pear, plum, cherry, and rose are to find regions and soils in this country where such stocks may be commercially grown and to demonstrate on a commercial scale that such stocks are equal to - or better than - those grown abroad. We use the word "commercial" here in the sense that the procedure throughout should be such that the results secured may be satisfactorily applied by the trade. Such work as is proposed will need the help and cooperation of the trade. Nurserymen have not been idle in the past in this field. As recently pointed out by Mr. Wm. Pitkin and others, nurserymen have tried for years to develop the business of producing fruit tree seedlings but, with the exception of the apple, no material progress has been made. It has been further pointed out that many nurserymen prefer to import French apple seedlings and pay more for them, believing that thereby they would secure better blocks of better trees.

Correlated with the problem of commercial stock production, is that of securing seeds for stocks. There are no contemplated restrictions, so far as we are aware, on the importation of fruit seeds. The restrictions brought about by war conditions, and the general situation with respect to seed for stocks, show the need for developing our own home supplies. This is a long time proposition, as there are few reconized sources of supply here, such as exist in Europe.

DEFINITIONS OF THE PLANTS AND PLANT MATERIALS ADMITTED UNDER RESTRICTIONS.

1. **Lily bulbs.** - Herbaceous perennials with scaly bulbs, belonging to the genus Lilium, and consisting of numerous species and varieties.

2. **Lily of the valley.** - Horizontal rootstocks, "pips", and clumps (without soil), of *Convallaria majalis.*

3. **Narcissus.** - Hardy bulbs of three species, *Narcissus Pseudo-narcissus* (the common daffodil), *N. bulbocodium* (hoop-petticoat daffodil), and *N. tazetta* (polyanthus narcissus), represented by numerous varieties.

4. **Hyacinth.** - Hardy spring-flowering liliaceous bulbs of many varieties derived chiefly from five species - namely, *Hyacinthus orientalis, H. amethystinus, H. azureus, H. lineatus,* and *H. fastigiatus*. Used for outside planting and forcing under glass.

5. **Tulip.** - Hardy and forcing bulbs of the genus Tulipa, family Liliaceae, imported chiefly from Holland.

6. **Crocus.** - Spring-flowering and autumn-flowering plants, all members of the genus Crocus, with solid bulbs or corms, represented by numerous species and varieties.

7. **Fruit stocks** (free stocks). - Seedlings or plants or parts of plants upon which a scion or bud may eventually be set. Carries neither grafts nor buds.

8. **Cuttings.** - Severed portions of plants used for propagating purposes by rooting in sand, soil, or other medium.

9. **Scions.** - Severed portions of plants which may be mechanically inserted on other plants (free stocks) for propagating purposes.

10. **Buds.** - Severed leaf buds with bark and wood attached, used for propagating purposes.

11. **Rose stocks.** - Seedlings or rooted plants of the genus Rosa, upon which cultivated varieties of the rose may be grafted or budded.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
D. A. Bisset, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
H. N. Veen, Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Tucson, Ariz.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 144. APRIL, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1305	Prunus 1309,	1313
Actinidia	1305	Pyrus 1309,	1310, 1311
Amaranthus	1306		
Castanea	1306	Rosa	1311
Ceratonia	1306	Schizophragma	1311
Citrus 1307,	1308	Solanum	1312
Corchorus	1308	Ulmus	1312
Gleditsia	1309		

Plates:

Pl. 237. The Nance, a West Guatemalan fruit, *Byrsonima crassifolia.*

238. A rubber-producing vine in the Everglades, *Cryptostegia grandiflora.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

January 29, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia pycnantha (Mimosaceae), 45867. **Golden Wattle.** From Richmond, Australia. Presented by Mr. F. H. Baker. A rapid-growing tree, attaining a height of about 30 feet, the bark of which is used for tanning. The flowers which are borne in clusters are yellow, hence the name, **golden wattle.** The tree has no soil preference, but is usually found on the poor sandy soil near the seacoast; here it serves also as a sand binder. The wood is tough and close-grained, having a specific gravity of 0.83. The bark contains as high as 33.5 per cent of tannin, and the dried leaves have yielded as much as 15.16 per cent of tannic acid. The range is South Australia, Victoria, and southern New South Wales. (From Maiden, Useful Plants of Australia, p. 312-313, and p. 365.)

Actinidia chinensis (Dilleniaceae), 45946. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2456a. Near Lung to ping, Hupeh, China. November 23, 1917.) A variety of **yang tao** bearing smooth fruits of various sizes ranging from that of a gooseberry to a good-sized plum. It possesses a good flavor though it sets one's teeth on edge as does the use of non-select pineapples and wild blueberries. This fruit really is of high promise for the United States, and especially so for the mild-wintered sections. It should preferably be grown as an arbor vine. In its native habitat one finds it bearing most heavily when crawling over low scrub and rocks on northeast exposures, where the plants are subjected occasionally to strong twisting winds which seem to check their tendency to excessive vegetative growth. Where this **yang tao** occurs one also finds around the farmsteads coir palms, loquats, bamboo clumps, tea plants, tung-oil trees, etc. The fruits when properly handled keep fresh for a long time; they ship and keep especially well after having been subjected to a slight frost. As to their uses, - they can be eaten out of hand or as a desert when skinned, sliced and sprinkled over with sugar; excellent preserves can also be made from them. The Chinese with their excessive vegetable diet and their abhorrence of sour fruits do not care for this fruit and let it waste mostly. However, Caucasians universally seem to enjoy this unique berry which in flavor combines that of gooseberry, strawberry, guava, and rhubarb. Possibly in some of the southern states new industries could be built up by cultivating this fruit for the

northern city markets. (The meaning of **yang tao** is 'male peach', which name is as inappropriate as is our name 'pineapple' for the Ananas.)" (Meyer.)

Amaranthus paniculatus (Amaranthaceae), 45811. **Guate.** From Culiacan, Sinaloa, Mexico. Procured by Mr. W. E. Chapman, American Consul, Mazatlan, from Mr. Frank G. Leeke, Culiacan. "**Guate** is an ancient Aztec foodstuff modernly used (popped) with sugar and milk as a breakfast food; also ground into meal after popping. Possible production, one half ton per acre. It grows semiwild amid corn as a secondary crop. The present production is very small, but can be stimulated if a market is opened." (Leeke.)

Castanea seguinii (Fagaceae), 45949. **Chinquapin.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 2459a. Ichang, Hupeh, China. November 16, 1917.) A shrubby **chinquapin** occasionally growing into a tree 25 to 40 feet high. Occurring on mountain slopes here and there in central China often in great quantities. Sprouts only 2 feet high often produce seeds. It appears to be totally resistant to the bark fungus, *Endothia parasitica*, and may be of considerable value in breeding experiments such as Dr. W.Van Fleet has been conducting for several years. This species seems to be more moisture-loving than *C. mollissima*, but it grows well on the most barren mountain slopes. Chinese name **moh pan li** meaning 'hairy board-oak'." (Meyer.)

Ceratonia siliqua (Caesalpiniaceae), 45924. **Carob.** From Valetta, Malta. Procured by Mr. Wilbur Keblinger, American Consul. The **carob tree** or **St. John's bread** is a handsome, slow-growing leguminous tree, with evergreen, glossy, dark green, pinnate leaves, forming a rounded top and attaining a great size. It grows well in the semiarid hills all around the Mediterranean, preferring limestone soils; it is sensitive to cold and does not succeed north of the orange-growing regions. The staminate and pistillate flowers are borne on different trees and it is necessary, in order to insure a crop of pods, to have a considerable proportion of staminate trees in the plantation. The large pods, which are chocolate-colored when ripe, are usually borne in great quantities and contain an abundance of saccharine matter around the smooth hard seeds. Italian analyses show the pods to contain over 40 per cent

of sugar, and some 8 per cent of protein, more than 75 per cent of the total weight is digestible. Unusually large trees may reach a height of 60 feet with a crown 75 feet in diameter, and may produce as high as 3,000 pounds of pods. These pods are a concentrated feed for horses, milch cows, and fattening stock; to a certain extent they replace oats for horse feed. Sirups and various sweetmeats are sometimes prepared from the **carob** pods; they are relished by most children and are sometimes offered for sale by fruit dealers in America. (Adapted from description by Mr. W. T. Swingle.) "It requires dry hot weather rather than moist heat. It has never done well in Florida but thrives in Southern California." (Fairchild.) See Inventory 35, Plate No. 3.

Citrus ichangensis (Rutaceae), 45931. **Lemon.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1288. Changyang, Hupeh, China. December 10, 1917.) A large variety of **Ichang lemon**, mostly shipped down to Shansi, a few days run down the river. The fruits sell wholesale at 1 cent (Mex.) a piece and retail at 2 to 3 cents (Mex.) according to size and supply. The Chinese, with their great dislike to sour fruits, never use these lemons in beverages but employ them only as room perfumers or carry them about to take an occasional smell at them, especially when passing malodorous places. Locally the rind is candied in a limited way and resembles orange peel in flavor and appearance. The fruits ripen during the month of October; and, since they do not possess long keeping qualities, they disappear very quickly. In fruit stores, in Ichang they are all gone by mid-December. The trees grow to medium-large size and resemble pomeloes in general appearance though they are less massive in outline and the foliage is of a lighter hue of green. The trees are densely branched and have large spines on the main branches and small ones even on the bearing branchlets. The foliage suffers a good deal from caterpillars; the trunks are attacked by borers, and maggots are occasionally found in the fruit. Foreign residents in and around Ichang make from these lemons a very fine lemonade which is of a more refreshing quality than the ordinary kind; they are also used in pastry, sauces, and preserves. On the whole it seems that this **Ichang lemon** is a very desirable home fruit for those sections of the United States that are

adapted to its culture, especially the South Atlantic and Gulf States. It may also prove to be hardier than any other citrus fruits of economic importance. Around Ichang, trees have withstood temperatures of 19° F. The Chinese name of this lemon is **Hsiang yuan.**" (Meyer.)

Citrus ichangensis (Rutaceae), 45937. **Lemon.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1294. Ichang, Hupeh, China. December 20, 1917.) An especially fine variety of **Ichang lemon**, very juicy, and having a delightful fragrance. It makes a superior lemonade. The tree is of a somewhat drooping habit, and the foliage very dense. Obtained from the garden of the British Consulate at Ichang." (Meyer.)

Citrus nobilis (Rutaceae), 45932. **Mandarin.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1289. Changyang, Hupeh, China. December 10, 1917.) A large **mandarin** of a fine light orange color with a somewhat corrugated skin; it contains but few seeds and has a sweet, refreshing flavor. Local names **Chun gan** and **Loba gan** meaning respectively 'Spring orange' and 'Turnip orange'." (Meyer.)

Corchorus capsularis (Tiliaceae), 45809. **Jute.** From Calcutta, India. Secured by Mr. Jas. A. Smith, American Consul General, from Ralli Brothers. This species and the closely allied *C. olitorius* are the chief sources of the jute fiber of commerce. *C. capsularis* is an annual, attaining a height of 8 to 12 feet, with a long, thin stem, branched only at the top. The flowers are small and yellow. The young shoots are commonly used as a pot-herb, especially in Egypt. The fiber is obtained by retting in stagnant pools. Retting consists in steeping the stems in water until they soften sufficiently to allow the fibro-vascular bundles to be extracted from the softer material around them. The fiber is extensively used in the manufacture of cordage, coarse cloth, fishing nets, gunny-bags etc. The plant requires a hot, moist climate followed by a dry season. The method of propagation consists either in broadcasting the seed, or in transplanting into rows the seedlings raised in a nursery. This plant is indigenous to Ceylon, India and Malaya. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 841, and Macmillan, Handbook of Tropical Gardening and Planting, p.542.)

THE NANCE, A WEST GUATEMALAN FRUIT.

(*Byrsonima crassifolia* (L.) H. B. K.)

This fruit, which is borne on small trees common in the village dooryards of the west coast of Guatemala, is bright yellow in color when fully ripe and has an acid, sometimes rather strong flavor. Each fruit contains a single seed the size of a cherry stone. Since the Nance tree occurs at altitudes of 4,000 feet in rich loam soil, it may succeed in California where the frosts are not too frequent. (Photographed by Wilson Popenoe, at Amatitlan, Guatemala, September 21, 1916; P16791FS.)

A RUBBER-PRODUCING VINE IN THE EVERGLADES.

(*Cryptostegia grandiflora.*)

There appear to be difficulties which have not yet been overcome in the profitable cultivation rubber-producing vines. The Cryptostegia has certain features about it which make it worth of the attention of those interested in rubber production, and it may not be too much to ho that some one will devise labor-saving methods which will make the cultivation of this vi profitable, utilizing, perhaps, the wood pulp and the floss from the pods as secondary produc Since its introduction, it has become established on the keys of Florida and in the Everglad near Davie, where the specimen photographed was growing. It has grown vigorously, n being injured by flooding. Mr. Robert Werner is holding up one of the strange-shaped, near ripe pods, while just below his fingers the white latex, which is produced in abundance, flowing from several incisions. The rubber of Cryptostegia, which is contained to the amou of 2 per cent dry weight in the twigs and leaves, is reported to be hardly equal to Cea rubber, although its general qualities are encouraging. (Photographed by David Fairchi February 6, 1916; P20012FS.)

Gleditsia sinensis (Caesalpiniaceae), 45803. **Locust.** From Yi Hsien, Shantung, China. Presented by Rev. R. G. Coonradt. A tree up to 60 feet in height with a trunk girth of 3 to 9 feet, found in the dry valleys of western Szechuan at altitudes ranging from 3,000 to 5,000 feet. It grows to a very large size, with a massive bole clean of branches for from 9 to 30 feet from the ground, and a wide-spreading head of thick branches. The bark is quite smooth and pale grey in color. In degree of spinescence the trees vary considerably and some are quite thornless. The wood is nearly white and of little value, but the flattened pods are rich in saponin and are valued as a substitute for soap, and are also used in the process of tanning hides. (Adapted from Sargent, Plantae Wilsonianae, vol. 2, p. 91.)

Prunus glandulosa (Amygdalaceae), 45944. **Plum.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1301. Ichang, China. December 30, 1917.) A shrubby, flowering plum growing to a height of from 3 to 5 feet. It can be trained to one stem but naturally grows into a densely-branched bush. It bears masses of double, rose-colored flowers in May and is a fine little shrub for borders and near door entrances in those regions where it is perfectly hardy. Obtained from the garden of the Customs Compound." (Meyer.)

Pyrus sp. (Malaceae), 45834. **Pear.** From Manchuria. Collected by Prof. F. G. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "No. 46. **Pin li,** or **Ping li.** Very similar to small **Suan li,** (S. P. I. Nos. 45846 & 45847). These seeds were obtained from fruit grown near the Chien Shan mountains, near Li-shan, Manchuria. This is a very popular cultivated variety in the Chien Shan region, and seems to be well adapted to the conditions there. The fruit is small, varying from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter, roundish or slightly flattened in shape, and greenish yellow in color, with often a blush on one side. It ripens during September and possesses a very agreeable and refreshing tart flavor. This variety undoubtedly has been derived from *P. ussuriensis,* as it resembles that species in tree, leaf and fruit characters. While the fruit has the tartness of that species, it is of very much better flavor, and the flesh is softer than in the wild form. The calyx is always persistent, open

and with distinctly spreading lobes. This variety will be thoroughly tested for blight resistance, and if it shows the marked degree of resistance characteristic of this species it should prove of great value, especially in breeding work." (Reimer.)

Pyrus sp. (Malaceae), 45845. **Pear.** From China. Collected by Prof. F. G. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**Ya kuang li.** From Maton, China. A large pear, shaped somewhat like a Bartlett, but thicker toward the base end. It is very juicy and of very good flavor, comparing favorably with the better European pears. I regard this as an extremely promising pear. It certainly possesses considerable *P. ussuriensis* blood and for this reason we anticipate that it will show a marked degree of resistance to pear blight. If this proves to be the case this will be one of the most valuable pears ever introduced into America. It should prove to be of the very greatest value for breeding work." (Reimer.)

Pyrus sp. (Malaceae), 45846. **Pear.** From China. Collected by Prof. F. G. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**Suan li.** From Lo Han Ling Pass, China. A small roundish or slightly flattened pear, greenish-yellow in color, often with a slight blush on one side. It is very juicy and possesses a very agreeable tart flavor. While too small for the general market it should prove valuable for the home orchard, local market, and for breeding work. This variety undoubtedly belongs to *P. ussuriensis*. Hence its great value for breeding work." (Reimer.)

Pyrus sp. (Malaceae), 45848. **Pear.** From China. Collected by Prof. F. G. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**Pai li.** From Cheng An Sze, near Peking, China. A medium-sized pear of lemon-yellow color with soft, juicy, sweet flesh of excellent flavor. This is regarded as one of the very best Chinese pears both by the Chinese and foreigners. It is an excellent keeper and can be obtained on the Peking market from October until March. This variety also shows some of the characteristics of *P. ussuriensis* and I believe that that species was one of its parents. These four varieties (S. P. I. Nos. 45845 to 45848) are far superior to any of the other numerous oriental pears, at least as judged by the tastes of Americans. They are the first oriental varieties that

I have ever eaten which I could pronounce as really good in quality. These varieties constitute by far the best material that I have ever seen for breeding blight-resistant varieties. They should also prove of value in breeding hardy pears for the cold plains region." (Reimer.)

Pyrus ussuriensis (Malaceae), 45833. **Pear.** From China. Collected by Prof. F. G. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "No. 60. Collected from wild trees at Shinglungshan, Pechilli, China. Trees of this species were formerly very abundant in this region, but as it has been opened up for settlement during the past five years, and as the soil is well suited to agriculture, most of the trees have been destroyed. However many trees are still left, especially along the margins of the valley, in the canyons and along the streams. These trees attain a very large size, often reaching 75 feet in height and 2½ feet in diameter. The fruit is roundish or slightly flattened, from 1 to 1½ inches in diameter, greenish in color, with gritty flesh and sour flavor. Earlier introductions of this species made by Mr. F. N. Meyer, have shown greater resistance to pear blight than any other species in the experiments at the Oregon Station. It appears to be very promising as a stock for cultivated pears in very cold regions in this country, and in regions where pear blight attacks the roots and trunks of the trees; also in breeding hardy and blight-resistant pears. It has given rise to some of the best cultivated varieties of northern China." (Reimer.)

Rosa gentiliana (Rosaceae), 45819. **Rose.** From Kew, England. Presented by the Director, Royal Botanic Gardens. A **rose** which is abundant in the mountainous regions of western Hupeh and eastern Szechuan, where it forms tangled masses 6 meters or more in height. It grows best in rocky situations from river level to 1,400 feet altitude. The numerous large white flowers are very fragrant, and the anthers are golden yellow. This species is easily distinguished by its glabrous pale gray shoots, and three to five foliolate leaves which are shining green above and very pallid beneath. (Adapted from Plantae Wilsonianae, vol. 2, p. 312.)

Schizophragma sp. (Hydrangeaceae), 45942. From China. Collected by Mr. Frank N. Meyer, Agricultural

Explorer for this Department. "(No. 1299. Tsung chia tsui, Hupeh, China. Altitude 3,000 feet. December 14, 1917.) An evergreen vine found trailing over rocks and boulders in a semishady place. The foliage is medium small and leathery, like that of a daphne. Apparently quite rare. To be tested under protection from extremes of sun and frost." (Meyer.)

Solanum muricatum (Solanaceae), 45812 to 45814. **Pepino.** From Equador. Presented by Mr. Frederic W. Goding, American Consul General, Guayaquil. "During a recent trip to the interior I saw thousands of the plants growing near Huigra, on a farm owned by Mr. Edward Morley. There are three varieties of the fruits; the green, the green striped with purple and the dark purple. This fruit forms a part of the diet of the people of the interior, being eaten raw or cooked in various ways; but foreigners prefer them in a salad as the common cucumber is prepared. Served in this way they are delicious." (Goding.) The **pepino** or 'melon pear' is an erect, spineless, bushy shrub or subshrub two or three feet high, the branches often with rough warty excrescences. The leaves are usually entire or with slightly undulate margins. The rather small flowers are borne in a long-stalked cluster. The corolla is bright blue and deeply five lobed. The ovoid fruit, four to six inches long is long-stalked and drooping. The color is yellow overlaid with splashes of violet purple. The yellow flesh is aromatic, tender, juicy, and in taste suggests an acid egg plant. In cultivated varieties the seeds are seldom present. This plant is said to be a native of Peru. In the north the season is too short for the fruit to develop, but the plant will set fruit freely in a cool greenhouse. Readily propagated by cuttings of the growing shoots. (Adapted from Bailey, Standard Cyclopedia of Horticulture, p. 3182.)

Ulmus sp. (Ulmaceae), 45943. **Elm.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1300. To tze wan, Hupeh, China. December 12, 1919.) An uncommon **elm** growing to a large size and found in mountain districts at low elevations. Young branches often corky, bark of old trunks grayish brown and fissured. Possibly a desirable shade and avenue tree for mild-wintered regions." (Meyer.)

Notes on Behavior of Previous Introductions.

A letter dated May 24, 1918, from Mr. H. Ness, Horticulturist in Charge of the Texas Agricultural Experiment Station reports as follows;

"Among the goodly number of newly introduced fruits which we obtained from your Bureau in February 1915, *Prunus sp.* No. 31652 has shown itself in fruiting this year to be one of the most valuable acquisitions in the way of a plum that has come within my experience. We have eleven trees. Two of these bore a heavy crop, which ripens during the first week of May, hence earlier than any cultivated plum, to my knowledge, in existence. The fruit is about the size of the Burbank plum, and fully its equal in quality. The meat is very firm, dark red, and of good flavor. The trees are the strongest growers of any plum that I know, and stood last summer's drouth which was so injurious to all kinds of plants here, without any apparent injury. Another excellent feature, which I noticed is that the fruit has not been attacked by the **curculio**, or any disease, nor were any diseases visible upon any part of the tree during last year's unfavorable condition."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
H. N. Veen, Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
D. A. Bisset, Assistant in Plant Introduction.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

CEIVED
EB 17 1919

PLANT IMMIGRANTS.

No. 145. MAY, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acanthorhiza	1317	Lagenaria	1320
Anacardium	1317	Latania	1320
Annona	1317	Magnolia	1320
Botor	1318	Pomaderris	1321
Calyptrocalyx	1318	Pyrus	1321
Colocasia	1324	Rubus	1322
Cydonia	1318	Solandra	1322
Cymbopogon	1318	Stizolobium	1322, 1323
Dendrocalamus	1319	Tamarix	1323
Diospyros	1324	Telfairia	1323
Dypsis	1319	Vitis	1523
Ipomea	1320		

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

February 4, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acanthorhiza aculeata. (Phoenicaceae), 45906. **Wendland palm.** From Venezuela. Collected by Mr. H. M. Curran, Laurel, Maryland. "A palm with a trunk 6 to 9 feet tall and 4 to 6 inches in diameter, armed with spiniform roots 3 to 4 inches in length. The leaves, forming a dense crown, are fan-shaped, green above and silvery below, about 3 feet in diameter on petioles 18 inches long. The leaf bases are densely covered with woolly scurf which splits into many strong fibers; and the branched inflorescence about 2 feet long, is also densely covered with white wooly scurf. The smooth fruit, three-fourths of an inch long by five eights of an inch in diameter, is not edible." (C. B. Doyle.)

Anacardium occidentale (Anacardiaceae), 45915. **Cashew.** From Panama, R. P. Presented by Mr. Ramon Arias-Feraud. "**Red cashew.** Trees, about 20 feet high, bearing fruits the third year." (Arias-F.) A handsome quick-growing tree reaching a height of 40 feet, with large, entire, oval leaves; the wood is close-grained, strong and durable, and is used for boat building. The **cashew,** like the poison ivy, possesses an acrid substance which is strongly irritant to the epidermis and the mucous membranes of human beings. The poisonous material is not, however, spread throughout the plant but is mostly concentrated in the rather soft shell of the nut which is borne upon a pear-shaped, red or yellow, fleshy receptacle, 2 to 4 inches long. This receptacle is edible and quite harmless when ripe, having a very agreeable subacid taste in the raw state, and is also very good when cooked. The nut is kidney-shaped or distinctly curved near the middle, and contains a single large kernel of quite firm flesh, of fine texture, and of delicate, very pleasant nutty flavor. No attempt, however, should be made to eat it in the raw state on account of the poisonous juice of the shell which must be driven off by the heat, so that roasting is an absolute necessity. (Adapted from Cook and Collins, Economic Plants of Porto Rico.)

Annona reticulata (Annonaceae), 45955. **Bullock's-heart.** From Colombia. Presented by Mr. W. O. Wolcott, Medellin, Colombia. "The tree grows about 15 feet high, is very thrifty, thriving best in a hot climate from sea-level to about 3,000 feet elevation, and apparently wants rich soil and plenty of moisture. The fruit is about the size and shape of a bullock's heart, and has a

thin, light greenish yellow skin. It is cut open and eaten with a spoon, there being no core, though many seeds. The flavor is very sugary and fine." (Wolcott.)

Botor tetragonoloba (Fabaceae), 45928. **Goa bean.** From Los Banos, P. I. Presented by the College of Agriculture. An annual twining vine with loose-flowered racemes of large light blue flowers, followed by square pods having a wing one-fourth of an inch broad on each angle. Grown in tropical and subtropical regions for the young tubers which are eaten raw or cooked, and for the young pods which are used like string beans. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2849.)

Calyptrocalyx spicatus (Phoenicaceae), 45957. **Palm.** From near Kandy, Ceylon. Secured by Mr. George F. Mitchell, Treasury Department, D. C., at the Peradeniya Botanical Gardens. This stately palm, native of Amboina and other islands of the Moluccan group, attains a height of 40 feet. The pinnate leaves have valvate leaflets with reflexed margins; the flowers, arranged on long spikelike spadices, produce orange-colored, one-seeded fruits. The wood is used for timber and the seeds serve as a substitute for betel-nuts. (Adapted from Gardeners' Chronicle, June, 1870, p. 765.)

Cydonia oblonga (Malaceae), 45889. **Quince.** From Murdock, Kansas. Presented by Mr. J. W. Riggs, Experiment Grounds. Scions from trees of a variety sent to the Office of Foreign Seed and Plant Introduction by Professor N. E. Hansen from Samarkand, Russian Turkestan, May 24, 1898, and given S. P. I. No. 1123. Mr. Riggs states that this variety has yielded fine fruit at Murdock when trees of standard quince varieties have not borne any fruit. The tree is hardy, not being injured in that section of Kansas by drought and heat. Scions grafted on apple stocks.

Cymbopogon martini (Poaceae), 45966. **Rusa-oil grass.** From Dehra Dun, U. P., India. Presented by Mr. R. S. Hole, Forest Botanist, Forest Research Institute and College. A stout perennial grass found in northern India. It grows to a height of 6 feet and has long, perfectly smooth leaves of a soft, delicate texture and a rich green color. The slender panicles, 8 to 12 inches long, turn to a bright reddish brown color in ripening. The distinction between the two kinds of

Rusa-oil (lemon oil) procured from this grass, viz., **motia** and **sufia**, which the distillers of Khandesh and the neighboring districts recognize, apparently depends on similar conditions, although the accounts concerning them are to some extent conflicting. The authors of the Pharmacographia Indica (vol. 3, p. 558) say: "The oil distillers in Khandesh call the grass **motiya** when the inflorescence is young and of a bluish white color; after it has ripened and become red, it is called **sonfiya**. The oil obtained from it in the first condition has a more delicate odor than that obtained from the ripened grass." On the other hand, Mr. E. G. Fernandez reports in a letter to Kew: "The **motia** species (or variety) is usually confined to the higher slopes, while the **sufia** grass is more common in the plains and on the plateau-land in the hills, but they are not infrequently found growing together. The **sufia** is much more strongly scented, but the odor of **motia** is preferred, and this latter commands double the price of the former." The samples of both forms supplied by Mr. Fernandez do not show any morphological differences, and as to age, some of the **motia** samples are in a more advanced stage than the **sufia**. (Adapted from Stapf, The Oil-grasses of India and Ceylon, in the Kew Bulletin of Miscellaneous Information, 1906, p. 341.)

Dendrocalamus giganteus (Poaceae), 45963. **Bamboo.** From near Kandy, Ceylon. Secured by Mr. George F. Mitchell, Treasury Department, Washington, D. C., at the Peradeniya Botanical Gardens. One of the largest of the bamboos, growing to a height of 100 feet with a stem diameter of 8 inches, the stem walls being one-half of an inch thick. It is probably indigenous in the hills of Martaban and is cultivated in Burma and also in most tropical countries. The stems are used for posts and rafters, and for piping water. (Adapted from Brandis, Indian Trees, p. 678.)

Dypsis madagascariensis (Phoenicaceae), 45958. **Palm.** From near Kandy, Ceylon. Secured by Mr. George F. Mitchell, Treasury Department, Washington, D. C., at the Peradeniya Botanical Gardens. A graceful Madagascar palm about 15 feet high, with leaves 10 feet long. The pinnate leaves, with 18-inch long segments arranged in fascicles of 6 or 8, seem to be arranged on the stem in threes, giving it a triangular appearance. This arrangement of the leaves and the fascicled

arrangement of the leaflets is peculiar to the genus Dypsis, not being found in any other pinnate-leaved palms. (Adapted from Gardeners' Chronicle, New Series, vol. 24, p. 394.)

Ipomea batatas (Convolvulaceae), 45971. **Sweet potato.** From Tolga, Queensland, Australia. Presented by Mr. J. A. Hamilton. "General Grant sweet potato, which to our fancy is the best variety for the table. As a rule the vines do not run very much. (Hamilton.)

Lagenaria vulgaris (Cucurbitaceae), 45904. **Gourd.** From Japan. Presented by Dr. L. H. Bailey, Ithaca, New York, who secured them from Governor H. Hiratsuka, Utsunomiya, Japan. "The largest gourd utensils I ever saw were at Utsunomiya, Japan. I asked for seeds of them and have received a packet from Governor H. Hiratsuka of the prefecture. I am sending you some of these seeds thinking that possibly you would like to have them grown at your Maryland or Florida Stations, where the season will probably allow them to mature. I should think that some of the gourds I saw in the market in Japan would hold at least a peck." (Bailey.)

Latania commersonii (Phoenicaceae), 45960. **Palm.** From near Kandy, Ceylon. Secured by Mr. George F. Mitchell, Treasury Department, Washington, D. C., at the Peradeniya Botanical Gardens. An unarmed palm from Mauritius, having leaves with petioles 4 to 6 feet long, the fan-shaped blades being about 5 feet in diameter and divided into lanceolate, acuminate segments, 2 feet long by 3 inches wide. It is a particularly striking palm, the long smooth petioles and the ribs of the fanlike leaves being colored a bright crimson which is especially brilliant in the young foliage. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1824.)

Magnolia globosa (Magnoliaceae), 45964. From Darjeeling, India. Secured by Mr. George F. Mitchell, Treasury Department, Washington, D. C., at the Lloyd Botanic Garden. "From Lloyd Botanic Garden, Darjeeling. Found at 10,000 feet elevation and requires a moist climate." (Mitchell.) A small tree with brown branches and ovate deciduous leaves 9 inches long by 6 inches wide. The globose flower buds, which appear with the young leaves, are about 2 inches in diameter and open

into fragrant white flowers 5 inches across. (Adapted from Hooker, Flora of British India, vol. 1, p. 41.)

Pomaderris elliptica (Rhamnaceae), 45892. **Kumarahou.** From Auckland, New Zealand. Presented by Mr. H. R. Wright. "A rare dwarf shrub belonging to the Auckland Province. This plant is difficult to transplant, but is easily raised from seed. It flowers when two years old and if kept well pinched back makes a glorious specimen, being covered in spring with a mass of yellow flowers. It grows on some of our poor clay lands of a close nature, similar to that where the heather grows." (Wright.) A branching shrub 4 to 8 feet high with the young branches, leaves and flower clusters covered with white or buff-colored stellate hairs. The ovate to oblong leaves are 2 to 3 inches long, and the cymes of yellow flowers, with crisped-margined petals, are clustered into large many-branched panicles. Native name **Kumarahou**, (from "Kumara," a tuber-like root, and "hou," growing deeply or strongly.) (Adapted from Cheeseman, Manual of the New Zealand Flora, p. 99, and from Laing and Blackwell, Plants of New Zealand, p. 236.)

Pyrus communis (Malaceae), 45901. **Pear.** From Missouri. Presented by Dr. J. C. Whitten, College of Agriculture, Columbia, Missouri. "The **Surprise pear** forwarded by Dr. Whitten of the College of Agriculture, Columbia, Mo., is one of the most promising as a blight-resistant pear and may prove of economic importance as a stock for commercial varieties. As grown by Prof. Reimer at Talent, Oregon, it was one of the most vigorous of stocks and seemed to transmit this vegetative character to nearly all varieties of pears which were grafted or budded upon it. Its congeniality, in other words, is to be commended. Dr. Whitten says that the **Surprise pear** is apparently a pure *Pyrus communis*. He further says that he received three trees for trial from Stark Bros., Louisiana, Mo., some years ago. This variety is a large, vigorous grower. It early begins the formation of short, spur-like branches, which spread horizontally, with few of the upright rank shoots customary to Kieffer and other hybrids. The fruit is small, not much larger than Seckel. It is moderately late, ripening only a little ahead of Kieffer, and is of poor quality. The variety bears profusely, however. Dr. Whitten says that he does not remember having seen a trace of blight in any

of the **Surprise** trees on his grounds, though they are growing in a pear orchard in which numerous susceptible varieties have died out entirely from blight, and other varieties have blighted more or less every year." (B. T. Galloway.)

Rubus sp. (Rosaceae), 45891. **Blackberry.** From Colombia. Presented by Mr. Hermano Apolinar-Maria, Institute de la Salle, Bogotá, at the request of Mr. F. M. Chapman, Washington, D. C. In April, 1913, while on a visit to Colombia, I found this variety growing in a little posada called El Pinon in the temperate zone at an elevation of 9,600 feet on the trail from Bogotá to Fusagasuga. El Pinon is exceedingly wet and this giant blackberry may be found only under the conditions which prevail there. It is not the El Moral de Castile, a cylindrical berry which grows in profusion at from 5,000 to 7,500 feet, but a much larger, rounder berry shaped more like a strawberry. These berries are often 3 inches in length." (Chapman.)

Solandra longiflora (Solanaceae), 45953. From Sydney, New South Wales, Australia. Presented by Mr. J. H. Maiden, Director, Botanic Garden. A West Indian evergreen shrubby vine, with ovate to obovate sharply pointed leaves on purplish petioles and yellow, fragrant flowers usually a foot long. If left untrimmed it is a rampant climber but can be grown as a dwarf shrub by constant pruning. It is an adaptive plant as it grows well in the driest and poorest places but does not appear to object to gross feeding. The foliage of this plant produces a valuable drug called solandrine which has the same active principles as atropine derived from the leaves and roots of *Atropa belladonna*. The best method of propagation is by cuttings which should be taken from the flowering branches just after the flowering season is over and planted in a well-drained light sandy soil. (Adapted from the Agricultural Gazette of New South Wales, vol. 28, p. 670.)

Stizolobium niveum (Fabaceae), 45940. **Dedman's bean.** From Salisbury, Rhodesia, Africa. Presented by the Director of Agriculture. One of the principle advantages that this bean has over the Florida velvet bean is the absence of the fine prickly hairs on the stem and leaves which makes the curing of that plant for hay a difficult operation. It also seems to be more resistant to frost. For these reasons **Dedman's bean,** or as it

is more commonly known here, **stingless velvet bean,** is gradually replacing the Florida variety."

Stizolobium pruritium officinale (Fabaceae), 45899. From Nicaragua. Presented by Mr. B. C. Sibley, Escuela de Agricultura, Chinandega, Nicaragua. "**Pica-pica.** From what I have observed of this plant it must be very much like the velvet bean of the Florida orchards. I have noticed that it is a very heavy producer of nitrogen nodules. They are very numerous and also quite large. This fact has been taken advantage of by the natives, so that they welcome the plant into the corn fields that lie fallow or resting. One other point in its favor is, that the stem of the plant during the growing season does not become hard and woody; so that, used as a green manure crop, it would soon decay in the soil after being plowed under." (Sibley.)

Tamarix aphylla (Tamaricaceae), 45952. **Tamarisk.** From Tucson, Arizona. Presented by Prof. J. J. Thornber, University of Arizona. This African **tamarisk,** the best of the Egyptian species for cultivation as a timber tree and as a windbreak on desert land, is also a very handsome ornamental. The galls, which are commonly produced on this species in southern Algiers and are much used by the natives for tanning, contain 45 per cent of pyrogallic tannin. (Adapted from letters of Dr. L. Trabut and Thos. W. Brown.)

Telfairia pedata (Cucurbitaceae), 45923. From East Africa. Presented by Mr. M. Buysman, Lawang, Java. A climbing shrub, native of Zanzibar, with palmately compound leaves, the three to five oblong leaflets being 3 to 5 inches long, toothed on the margin and long pointed. The pale purple flowers have a fringed corolla from 2 to 4 inches broad, and the oblong fruit, with 10 to 12 deep furrows, is often 3 feet long and 8 inches in diameter. The seeds are flat and round, about an inch across, with sweet edible kernels tasting like almonds, and yield an abundance of a clear bland oil which is said to be equal to olive oil. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 6, p. 3320.)

Vitis vinifera (Vitaceae), 45968. **Grape.** From Tokyo, Japan. Purchased from the Tokyo Plant, Seed and Implement Company. "**Koshu.** A very sweet variety of grape which seems to be especially suited to the Tokyo climate." (F. N. Meyer.)

Notes on Behavior of Previous Introductions.

In a letter dated November 2, 1918, Mr. S. Elce, of Mary Esther, Florida, reports as follows; "I have at last the great pleasure of forwarding to you a sample of fruit from a Chinese persimmon plant (*Diospyros kaki*, S. P. I. No. 22350.) you sent me about six years ago. The tree bore three fruits last year, which dropped while green; this year we have nine fine fruits uniform in size and color. One ripened in advance of the others and we ate it direct from the tree and found it more delicious in flavor than any we have as yet tasted from neighboring orchards – and seedless! The one I am sending to you is not fully ripe, but I expect it will be when you receive it; if it is not soft, please keep it a few days, or until it is so. You will find it worth waiting for. I send it in condition to carry through the mail. The tree is fine and healthy, 8 feet high. It has withstood the storms which destroyed our peaches and plums two or three years ago, droughts, etc. You sent me some dasheens (*Colocasia sp.* S. P. I. No. 19224) five or six years ago, which prospered finely and were the admiration of all beholders; the tubers and shoots we found most excellent on the table."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
H. N. Veen, Assistant in Plant Introduction.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
J. E. Morrow, Superintendent in Charge, Plant Introduction Field Station, Brooksville, Fla.
D. A. Bisset, Assistant in Plant Introduction.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 146. JUNE, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	S.P.I. No.	Page
Astragalus	(45995)	1327
Berberis	(45973)	1327
Cucumis	(46029)	1327
Decaisnea	(45977)	1327
Dioscorea	(45991 to 45994)	1328, 1329
Erythrina	(45998)	1329
Holboellia	(45978)	1329
Livistona	(45980)	1329
Prunus	(46003)	1330
Sabinea	(46026)	1330
Viburnum	(45974)	1331

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

February 14, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Astragalus sinicus (Fabaceae), 45995. **Genge clover.** From Yokohama, Japan. Purchased from the Yokohama Nursery Company. **Late Giant** variety. "Another field crop very extensively grown for human food, and partly as a source of soil nitrogen, is closely allied to our alfalfa. Tender tips of the stem are gathered before the stage of blossoming is reached and served as food after boiling or steaming. It is known among the foreigners as **Chinese clover.** The stems are also cooked and then dried for use when the crop is out of season. For the tender shoots, when picked very young, wealthy Chinese families pay an extra high price, sometimes as much as 20 to 28 cents our currency per pound." (King, Farmers of Forty Centuries, p. 128.)

Berberis japonica bealei (Berberidaceae), 45973. From Batum, Russia. Presented by the Superintendent, Botanical Garden. A stiff evergreen shrub native of China, often 10 feet in height, with thick, unbranched stems. The pinnate leaves, 1 to 2 feet long, are made up of 7 to 13 obliquely ovate, dark dull green leaflets 8 inches long by 6 inches wide, having 4 to 6 large spiny teeth along each margin. The delightfully fragrant lemon-yellow flowers are borne in a cluster of several slender erect racemes 6 to 9 inches long, and are followed by oblong purple berries one-half of an inch long. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 244.)

Cucumis melo (Cucurbitaceae), 46029. **Australian casaba.** From Burringbar, Australia. Presented by Mr. B. Harrison. "I am enclosing seeds of the **Australian casaba,** the correct name of which I do not know, but which I believe originally came from India. It is a most prolific plant, bearing cream-colored fruit about the size of a cucumber. It is sometimes called the **apple melon,** and is quite popular here, being very palatable when eaten with sugar or made up into pies. It is hardy, prolific, and early, and should thrive well throughout the United States."(Harrison.)

Decaisnea insignis (Lardizabalaceae), 45977. From India. Seeds presented by Mr. George F. Mitchell, Washington, D. C., who obtained them from Mr. G. H. Cave, Lloyd Botanic Garden, Darjeeling, India. "A bush from northern Sikkim, that bears wonderful fruit about as large around as one's thumb and about 4 inches long. Mr. Cave sent a man to Sikkim especially to

secure the seed of this fruit." (Mitchell.) An upright, sparingly branched shrub, much resembling a large-leaved sumac, found in the eastern Himalayas in India. The leaves, often 3 feet long, are made up of 13 to 25 elliptic, acuminate leaflets, 2 to 5 inches long, bright green above and slightly glaucous beneath. The racemes of pendulous, greenish flowers resemble those of a yucca, but are smaller. They are followed by yellow, edible fruits, 3 to 4 inches long and about 2 inches thick, filled with a whitish pulp and black seeds. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 974.)

Dioscorea bulbifera (Dioscoreaceae), 45994. **Yam.** From Mayaguez, Porto Rico. Presented by Mr. C. F. Kinman, Horticulturist, Porto Rico Agricultural Experiment Station. "The aerial tubers of this yam are somewhat better for food than the ground tubers, according to Mr. C. F. Kinman. The flesh is yellow and rather strong-flavored, - often practically inedible. The aerial tubers are very tough-skinned and keep for a long time." (R. A. Young.)

Dioscorea pentaphylla (Dioscoreaceae), 45991. **Yam.** From Mayaguez, Porto Rico. Presented by Mr. C. F.Kinman, Horticulturist, Porto Rico Agricultural Experiment Station. "A rather small, smooth-skinned yam, called in Porto Rico **potato yam.** Said by Mr. C. F. Kinman to have come from Africa. The tubers, when well-grown, average about 12 ounces in weight. The skin somewhat resembles that of the white potato. The flesh is usually white, slightly mealy when cooked and mashed, and is sweet. These qualities appear to be variable and, while the yam is sometimes very good, it is occasionally very poor. Of possible value for central and southern Florida." (R. A. Young.)

Dioscorea sativa (Dioscoreaceae), 45993. **Yam.** From Mayaguez, Porto Rico. Presented by Mr. C. F. Kinman, Horticulturist, Porto Rico Agricultural Experiment Station. "**Guinea.** A large yam, said to reach a weight of 20 to 25 pounds in Porto Rico, and to be of good quality. It thrives there in heavy clay soil and with a rather small amount of rain. This variety appears to be slightly different from those (S. P. I. No. 45990) recently received from Trinidad." (R. A. Young.)

Dioscorea trifida (Dioscoreaceae), 45992. **Yampi.** From Mayaguez, Porto Rico. Presented by Mr. C. F. Kinman, Horticulturist, Porto Rico Agricultural Experiment Station. "A root-covered, white, sweetish **yampi.** Usually of very good quality, though somewhat fibrous. The tubers are said to average about three-quarters of a pound each when well grown. This **yampi** may prove of value on the peninsula of Florida." (R. A. Young.)

Erythrina arborescens (Fabaceae), 45998. **Coral tree.** From Egypt. Presented by Mr. Thomas W. Brown, Director, Horticultural Section, Ministry of Agriculture, Giza, Mouderieh. A low tree found in northern India, from Kumaon to Sikkim and in the Khasia Hills, up to an elevation of 7,000 feet. The light green pinnate leaves are made up of 3 leaflets, 5 to 7 inches long and nearly as broad. The racemes of vivid scarlet flowers, sometimes 15 inches long, appear during the hot season while the tree is still leafless. The lanceolate, curved, brownish pubescent pods contain 2 to 10 large, dull black seeds. The wood is white, soft and light, and is used for making boxes and toys. (Adapted from Brandis, Indian Trees, p. 227.)

Holboellia latifolia (Lardizabalaceae), 45978. From India. Seeds presented by Mr. George F. Mitchell, Washington, D. C., who obtained them from Mr. G. H. Cave, Lloyd Botanic Garden, Darjeeling, India. "Grows in Darjeeling, and is a vine bearing a nice fruit, purple in color, the size of one's thumb, with subacid pulp. The flower is also very showy. The native name of this fruit is **gophila.**" (Mitchell.) A twining shrub from India, with digitately compound leaves having 3 to 7 obovate to oblong, coriaceous leaflets, 2 to 4 inches long. The fragrant flowers, appearing in small racemes, are of 2 kinds, the staminate being greenish and the pistillate purple. The edible fruits, usually 2 together, are about 4 inches long by 2 inches thick, rosy-purple in color and filled with small black seeds. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 3, p. 1496.)

Livistona mariae (Phoenicaceae), 45980. **Palm.** From South Australia. Presented by Mr. J. F. Bailey, Director, Botanic Garden, Adelaide. "These seeds were obtained from the Macdonnell Range through Dr. E. Angas Johnson of this city." (Bailey.) An erect palm with fan-shaped leaves divided into narrow plicate

segments. This palm was found in the Glen of Palms in the Macdonnell Range, and seems to be very little known. (Adapted from Bentham, Flora Australiensis, vol. 7, p. 146.)

Prunus glandulosa (Amygdalaceae), 46003. **Cherry.** From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for this Department. "(No. 1303. Ichang, Hupeh, China. March 4, 1918.) A spreading shrub, with many slender twigs, growing to a height of from 3 to 5 feet, flowering early in spring with a multitude of small, rosy-white flowers which are followed by an abundance of small fruits of purple-black color and of fresh sour taste. These tiny cherries lend themselves well to be made into excellent preserves and are utilized so by the Roman Catholic Missionaries in the southwest part of Hupeh, where this bush cherry is found very frequently in gardens. Since this species of Prunus thrives in regions with high summer temperatures and great humidity it probably will succeed in the South Atlantic and Gulf States. By selection and hybridization larger-fruited forms should be developed and a new fruiting shrub for the home garden would be the result. Obtained from the garden of the Roman Catholic convent at Ichang. Chinese name **Gai yuen tao,** meaning 'dwarf diminutive peach'." (Meyer.)

Sabinea carinalis (Fabaceae), 46026. From Dominica, British West Indies. Presented by Mr. Joseph Jones, Curator, Botanic Station. This small tree is known locally as **Bois Charibe,** and is one of the most showy of our native plants. It is a very fine flowering tree and I have seen nothing in the tropics to surpass it as a mass of color. If grown on fairly good land it will not make a good show but if planted on a dry, rocky hillside where it will be scorched by the sun for a period of 3 or 4 months each year, it makes a marvelous display of flowers. It would probably succeed in the hot parts of California. (Adapted from transmitting letter of Mr. Jones.) A shrub or small tree with abruptly pinnate leaves having 6 to 8 pairs of oblong leaflets. The large, bright scarlet flowers are borne in fascicles of 3 to 5 and appear before the leaves. (Adapted from Grisebach, Flora of the British West Indian Islands, p. 183.)

Viburnum dilatatum (Caprifoliaceae), 45974. From Batum, Russia. Presented by the Superintendent, Botanic Garden. A hardy, handsome, free-flowering shrub, up to 10 feet in height, found in China and Japan. The broadly ovate, abruptly short-pointed, coarsely serrate leaves, 2 to 5 inches long, are pubescent on both sides. The pure white flowers in cymes 3 to 6 inches across, are followed by clusters of scarlet fruits which remain on the branches well into the winter. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 6, p. 3461.)

Notes from Correspondents.

Believing that the following letter will prove of interest to our collaborators, inasmuch as it deals almost exclusively with plants with which we are experimenting or that we are trying to secure for experimentation, we are quoting it entire.

"Since returning from Algeria I have been so busy that I have not had time to write you about a number of plants which Dr. Trabut brought to my attention and which may be of interest to this country.

"*Argania.* I am sending you a small quantity of seeds collected from an Argania tree growing in a garden in the School of Medicine in Algiers.

"*Berseem.* By 20 years' selection from the Muscawy race, Dr. Trabut has obtained a strain which is perfectly hardy at Algiers. He finds that the best results are obtained by sowing in October, this early sowing giving superior cold resistance. At the Jardin d'Essai, at Algiers, we saw a lawn of drilled alfalfa which it is customary to seed between the rows of Berseem in October, thus obtaining a fresh green covering throughout the year. It might be interesting to try this method of seeding Berseem for forage purposes in the warmer part of the Southwest.

"*Pinus canariensis.* Dr. Trabut considers this the finest of all pines for planting under rather dry conditions. A dry, steep hillside above the Jardin d'Essai, at Algiers, where the soil is very shallow and must contain extremely limited moisture during the greater part of the year, has a fine stand of these pines. The tree is a very handsome one, often branched, with long pendant needles and large cones.

"*Buxus balearica.* We saw this handsome shrub or small tree growing at Algiers. It is said to be native in the mountains of Morocco as well as in the Balearic

Islands. It has larger leaves than the common Buxus.

"*Bignonia tweediana.* This handsome climber is remarkable for the fishhook-like tendrils which cling most tenaciously to any object. It is said to have handsome, large yellow flowers and appears to be very satisfactory for covering walls.

"*Platanus.* Dr. Trabut says that the plane tree commonly grown in Algeria and southern France is a hybrid of *P. orientalis* with *P. occidentalis.* The trees certainly show a great deal of variation and forms can be seen which resemble either of the supposed parents. Dr. Trabut says that the tree is easily propagated by cuttings.

"*Gingko.* Dr. Trabut says that this tree is easily grafted, which I had not known to be the case.

"*Grape hybrids.* At the Viticultural Station at Rouiba we saw a great number of hybrids between European and American grapes, *Vitis Berlandieri* being the American parent which gives the most satisfactory hybrids for Algerian conditions. Dr. Trabut says that there is a high positive correlation between round and unlobed leaves with resistance to drought and to calcareous soils.

"*Grapes.* Dr. Trabut has some very interesting varieties from the Kabyle mountain region in his collection. One variety which we tasted, known as 'Amokrane', is a large white grape somewhat softer than the 'Flame Tokay' (which Dr. Trabut believes to be also of Kabyle origin) but firm enough to ship well. It has more flavor than the 'Flame Tokay' and is moderately sweet and very refreshing. Dr. Trabut says that the variety known as 'St. Jeannet', grown in the Alpes Maritimes in France, is similar but superior to the 'Amokrane'. He says that all Kabyle grapes being grown from seed must be selected carefully for reproduction, inferior strains being often included under the same name as good ones.

"*Walnut.* Native Kabyle races of the Persian walnut (*J. regia*) do very well at Algiers, while French varieties do not. The latter succeed best on *J. nigra* stock.

"Kabyle varieties of grapes and walnuts are usually grown from the seed and, according to Dr. Trabut, are much more likely to come true from seed than European varieties which are vegetatively propagated.

"*Artichoke.* Dr. Trabut has a very interesting series of artichoke seedlings and hybrids in his experimental garden at Maison Carree, some of the forms having

nearly spineless leaves and producing enormous heads.

"*Sisal.* Dr. Trabut has hybridized the Sisal plant with an unnamed species of Agave from Potosi, Mexico, and has obtained a most interesting series of forms which he says has been studied by an assistant of Dr. Trelease. Dr. Trabut says that the types which have the broadest, flattest and most nearly spineless leaves yield the best fiber.

"*Opuntia hybrids.* Dr. Trabut has a very interesting series of hybrids between different species (*O. ficus-indica, O. tuna,* etc.) some of which have very large and juicy fruits.

"*Chloris gayana* is a very valuable grass in Dr. Trabut's estimation. He says that it is very aggressive and will often drive out Bermuda grass when in competition with it.

"*Pecan.* This nut is coming into favor in Algeria where it does very well and is being frequently planted. On the other hand, Dr. Trabut's efforts to popularize the grapefruit and avocado have not been successful, the French appearing not to care for either of these fruits.

"*Boston fern.* In his interesting little garden at the Ecole de Medecine Dr. Trabut has some interesting variations of the Boston fern, one of them having remarkably finely divided leaves and being almost as delicate in appearance as an Adiantum.

"*Saccharum spontaneum aegyptiacum.* This grass is considered by Dr. Trabut to be a very valuable sand binder, which he thinks will be useful in subtropical climates like that of Florida.

"*Tecoma hybrids.* We saw a great many hybrids of the arborescent form (*T. stans* type) with scarlet, orange, bright yellow, white and rose-colored flowers. This plant seems to be a very popular ornamental in Algeria.

"*Eucalyptus.* Dr. Trabut has been experimenting for years with species of Eucalyptus and has obtained some interesting hybrids. He says that *E. occidentalis* and *E. robusta* are the species which do best in poorly drained land containing alkali. *E. punctata* is an especially beautiful species of which we saw a remarkably fine avenue at L'Arba. In a planting made by the Forest Service a few miles west of Algiers the hybrid between *E. rostrata* and *E. rudis,* which is known as *E. algeriensis,* seeds itself readily. No other eucalyptus grown in Algeria is known to do this. Many of the large plantings of eucalyptus in Algeria have been cut down for firewood, since the war began, but they sprout readily from the

stump and soon renew themselves.

"*Lime.* On the Bertrand estate at L'Arba we saw a remarkably large-fruited variety of lime known as 'limoncello di Napoli'. The fruits must be three times as large as our ordinary lime.

"*Fig.* The Verdale variety does excellently in Algeria and is considered a very heavy yielder. There is but one crop but the figs ripen successively from September to December.

"*Celosia.* In the public garden at Oran we saw a beautiful, red-leaved Celosia grown as a bedding plant.

"*Saccharum* (*Erianthus*) *ravennae.* This grass is very common in wet ground at Biskra and ought to be valuable for ornamental planting, fully as effective in its way as pampas grass. It grows in clumps, is quite tall, and has a large, silvery, purplish panicle.

"Hybrid Origin of Cultivated Plants. - Dr. Trabut says that all cultivated plants, the origin of which he has carefully investigated, are hybrids between more than one natural species, and mentions alfalfa, oats, fig, and pear as illustrations.

"It is not unlikely that Dr. Trabut will visit the United States in the near future with Mr. Brunel, the Director of Agriculture of Algeria. Dr. Trabut, as you know, is a perfect storehouse of botanical and horticultural information, much of which has not been published. For this reason an opportunity to visit Florida and California with him would be one of the most instructive and interesting experiences any one could possibly have.

"I saw M. Jacques de Vilmorin in Paris and asked him in regard to the seed drying machinery which you spoke to me about. He said that the principle had been worked out and they were just starting to have one constructed when the war broke out, since which time nothing further had been done about it. M. de Vilmorin was mobilized and, after seeing some active service, was detailed to the Ministry of Agriculture, where, I understand, he has been placed in charge of emergency seed work.

"Very sincerely yours,"

(Signed) T. H. Kearney.

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
J. E. Morrow, Superintendent.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 147. JULY, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Boehmeria	1337	Lansium	1340
Cajan	1337	Prunus	1340, 1342
Chrysophyllum	1338	Rosa	1341
Elaeis	1338	Rubia	1341
Fraxinus	1338	Salvia	1341
Garcinia	1339	Xanthosoma	1342
Gossypium	1340	Zea	1342

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

February 21, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Boehmeria macrophylla (Urticaceae), 46080. From Darjeeling, India. Presented by Mr. G. H. Cave, Director, Lloyd Botanic Garden. A pretty shrub with narrow, dentate leaves, 6 to 12 inches in length, and very long, drooping flower spikes. It is a native of Upper Burma and northeastern India, where it ascends to an altitude of 4,000 feet. The wood is light reddish brown and moderately hard, and the bark yields a good fiber which is used for ropes and fishing lines. (Adapted from J. S. Gamble, Manual of Indian Timbers, p. 658, 1902.)

Cajan indicum (Fabaceae), 46050. **Pigeon-pea.** From New York, N. Y. Purchased from S. Rosen. "The pigeon-pea, or **guandu,** supposed to be a native of India, is cultivated widely for food in the tropics and subtropics. It is perennial in frostless regions, but is usually cultivated as an annual. About ten months are required to mature the seed. Frost kills the plants. There are many varieties of pigeon-peas, some suitable for food and some not. Being a legume, the crop is valuable for soil improvement as well as for the seed. The plant develops into a large, semi-woody bush reaching a height of from 5 to 10 feet. When grown for seed, plant 2 or 3 seeds in each hill, in four-foot rows, and 3 feet apart in the row, thinning later to one plant in a hill. Pigeon-peas are resistant to excessive rains in the tropics, and the seed does not rot when planted as is the tendency with some other leguminous crops. Although the skin of the pigeon-pea is a little tough the flavor of the peas is good. They are cooked like ordinary shelled beans, that is, soaked over night and then parboiled 10 to 15 minutes with a little soda in the water; boiling for one hour or a little more after this usually cooks them completely." (Young.) "The Hawaiian Experiment Station, at Haikee on the island of Maui, has grown 15 acres of this pea as a forage crop; and Mr. Krause informs us that the practice is to cut the upper third of the plant, which bears practically all the pods, cure this like hay on portable hay-curing trucks, and, after 7 to 10 days, mill it by the hammer-throw process. The meal is as fine as alfalfa meal, and is used as a base with ground cane tops, corn meal and molasses (35% of the meal being used). This has a feeding value higher than that of alfalfa. It is cut twice and the plants are in their prime the third year. The yields range from 3 to 4 tons of cured pigeon-pea tops per

annum on land which will not produce 25 bushels of corn. The species is decidedly drought-resistant as tropical plants go." (Fairchild.)

Chrysophyllum cainito (Sapotaceae), 46150. **Star-apple.** From Panama, Republic of Panama. Presented by Mr. Ramon Arias-Feraud. "Purple **star-apple** seeds." (Arias-Feraud.) A handsome tropical American fruit and ornamental tree, evergreen, up to 50 feet high, with beautiful broad leaves, smooth and green above and silky and golden yellow on the under surface. Fruit the size of an apple with star-shaped core and purple flesh and skin. The pulp is said to be delicious if the fruit is left on the tree until ripe. Will not stand frost.

Elaeis melanococca (Phoenicaceae), 46048. **Noli palm.** From San Lorenzo, Tolima, Colombia. Presented by Mr. M. T. Dawe, Estacion Agronomica Tropical. A palm with practically no stem, the leaves, 8 to 10 feet long, being borne from within 2 to 6 feet from the ground. The fruits, which are compressed, irregular, and orange-red in color when ripe, are borne in dense clusters. Two classes of oil are obtained: red oil from the coating of the seeds, and a clear oil from the kernels; the latter is very much prized as a cooking oil. The palm is common in the lowlands among flooded areas under conditions similar to those of our flooded bottom land along the Mississippi and other Gulf Coast rivers. (Adapted from Curran.) "This palm is called **noli palm** in Colombia, **coquito** in Costa Rica, and **corozo colorado** in Panama." (C. B. Doyle.)

Fraxinus floribunda (Oleaceae), 46083. **Ash.** From Darjeeling, India. Presented by Mr. G. H. Cave, Director, Lloyd Botanic Garden. "This is a large deciduous tree found growing in the Himalayas from Indus to Sikkim, at elevations between 5,000 and 8,500 feet. A concrete, saccharine exudation called manna is obtained from the stem of this tree and is employed as a substitute for the officinal manna. The sugar, mannite, contained in this exudation, differs from cane and grape sugar in not being readily fermentable, although under certain conditions it does ferment and yields a quantity of alcohol varying in strength from 13 to 33 per cent. Like the officinal manna this is used for its sweetening and slightly laxative properties. The wood is white with a reddish tinge and

soft to moderately hard in structure, resembling in some respects the European ash. This tree is very valuable and is used in the manufacture of oars, sampan poles, plows, platters, spinning wheels, and for many other purposes." (Watt's Dictionary of the Economic Products of India, vol. 3, p. 442.)

Garcinia mangostana (Clusiaceae), 46204. **Mangosteen.** From Buitenzorg, Java. Presented by the Director, Botanic Garden. "This delicious fruit is about the size of a mandarin orange, round and slightly flattened at each end, with a smooth, thick rind, rich red-purple in color, with here and there a bright, hardened drop of yellow juice which marks some injury to the rind when it was young. As these mangosteens are sold in the Dutch East Indies - heaped up on fruit baskets or made up into long, regular bunches, with thin strips of braided bamboo - they are as strikingly handsome as anything of the kind could well be; but it is only when the fruit is opened that its real beauty is seen. The rind is thick and tough, and, in order to get at the pulp inside, it requires a circular cut with a sharp knife to lift the top half off like a cap, exposing the white segments, five, six, or seven in number, lying loose in the cup. The cut surface of the rind is of a most delicate pink color and is studded with small yellow points, formed by the drops of exuding juice. As you lift out of this cup, one by one, the delicate segments, which are the size and shape of those of a mandarin orange, the light pink sides of the cup, and the veins of white and yellow embedded in it, are visible. The separate segments are between snow-white and ivory in color and are covered with a delicate network of fibers, and the side of each segment, where it presses against its neighbor, is translucent and slightly tinged with pale green. As one poises the dainty bit of snowy fruit on his fork and looks at the empty pink cup from which it has been taken, he hardly knows whether the delicate flavor or the beautiful coloring of the fruit pleases him the more; and he invariably stops to admire the rapidly deepening color of the cut rind as it changes, on exposure to the air, from light pink to deep brown. The texture of the mangosteen pulp much resembles that of a well-ripened plum, only it is so delicate that it melts in your mouth like a bit of ice cream. The flavor is quite indescribably delicious and resembles nothing you know of, and yet reminds you,

with a long after-taste, of all sorts of creams and ices. There is nothing to mar the perfection of the fruit, unless it be that the juice from the rind forms an indelible stain on a white napkin. Even the seeds are often partly or wholly lacking, and, when present, are generally so thin and small that they are really no trouble to get rid of. Where cheap and abundant, as in Java, one eats these fruits by the half peck, and is never tired of them. They produce no feeling of satiety, such as the banana and the mango do, for there is little substance to the delicate pulp." (David Fairchild.)

Gossypium barbadense x hirsutum (Malvaceae), 46074. **Cotton.** From Brisbane, Australia. Presented by Mr. Leslie Gordon Corrie. **"Jones' Hybrid.** This variety was first observed in numerous fields of cotton in 1906, and, as far as can be surmised, is a sport originating from a Sea Island variety **Seabrook** and an Upland type **Russell's Big Boll."** (Quoted from an article by Mr. D. Jones, in the Queensland Agricultural Journal for March, 1916, p. 153.)

Lansium domesticum (Meliaceae), 46220. **Langsat.** From Buitenzorg, Java. Presented by the Director, Botanic Garden. A moderate-sized ornamental tree, native of Malaya. It bears long, pendant clusters of closely packed berries which have a thin tough skin enclosing opaque, aromatic, juicy pulp. The berries are pale yellow when ripe and are said to be much relished in their native country, being "eaten fresh or variously prepared." Dr. Ward described it as "one of the finest fruits of the Malayan peninsula." (Adapted from MacMillan, A Handbook of Tropical Gardening and Planting, ed. 2, p. 168.) For previous introduction and description see S. P. I. No. 45616.

Prunus cerasoides (Amygdalaceae), 46093. From Darjeeling, India. Presented by Mr. G. H. Cave, Director, Lloyd Botanic Garden. A large tree, making a brilliant appearance when in flower, native of northern India at an altitude of 3,000 to 8,000 feet. The leaves are ovate to lanceolate, 3 to 5 inches long, with doubly serrate margins. The flowers, which appear before the leaves, are either solitary or in umbels and are rose-red or white. The acid fruits, on prominently thickened pedicels, are oblong and have a thin, yellowish or reddish flesh. (Adapted from Hooker, Flora of British India, vol. 2, p. 314.)

Rosa chinensis (Rosaceae), 46078. **Rose.** From England. Purchased from Messrs. Paul & Son, Cheshunt, Herts. "**Red-Letter Day.** Garden form of *Rosa chinensis.* Dwarf shrub with erect stems growing about 2 feet high. Flowers single or semidouble, intense scarlet-crimson, best of its color. Desirable for breeding." (W. Van Fleet.)

Rosa macrophylla (Rosaceae), 46097. **Rose.** From Darjeeling, India. Presented by Mr. G. H. Cave, Director, Lloyd Botanic Garden. A shrub, native of the Himalayas and western China, becoming 8 feet or more in height, with erect stems and arching branches usually furnished with straight prickles, up to half an inch in length. The leaves, which are composed of from 5 to 11 leaflets, approach 8 inches in length. The deep pink or red flowers are sometimes 3 inches in width, and are produced singly or in clusters of varying number. The elongated, pear-shaped fruits are bright red. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 2, p. 433.)

Rubia cordifolia (Rubiaceae), 46099. **Madder.** From Darjeeling, India. Presented by Mr. G. H. Cave, Director, Lloyd Botanic Garden. An herbaceous creeper with perennial roots, which is met with in the hilly districts of India, from the northwest Himalayas eastward and southward to Ceylon. The Manjit root, or East India madder, is obtained for the most part from this species and is much employed by the natives of India for dyeing coarse cotton fabric, or the thread from which it is woven, various shades of scarlet, coffee-brown, or mauve. The East India madder of commerce consists of a short stalk from which diverge numerous cylindrical roots, about the size of a quill. These are covered with a thin, brownish pulp which peels off in flakes, disclosing a red-brown bark marked by longitudinal furrows. Many different methods are used for dyeing with this madder, a short account of which may be found in Watt's Dictionary of the Economic Products of India, from which this description is adapted.

Salvia hispanica (Menthaceae), 46146. From Mexico. Presented by Mrs. Zelia Nuttall. Coyoacan, D. F. An herbaceous perennial with ovate, serrate leaves and quadrangular spikes of blue flowers. The mucilaginous seeds are used in making the Mexican drink called "chia."

Xanthosoma sagittaefolium (Araceae), 46030. **Yautia.** From Porto Rico. Presented by Mr. W. J. McGee, Chief, Bureau of Chemistry Experiment Station, San Juan. "A yellow-fleshed yautia of good quality. It will be of especial interest in central and southern Florida." (R. A. Young.)

Zea mays (Poaceae), 46056. **Corn.** From Mexico. Presented by the Estate of Diego Moreno, Guadalajara, Jalisco. "**Maiz pepitilla.** It is sown here in two ways: either three grains each in hills 1 m. (3¼ ft.) apart, or single grains in hills 0.25 m. apart, the latter being the better method. In either case, the furrows are a distance of 84 cm. (33 in.) apart. In hot lands, or along the coast, it yields in three months; in lands of moderate temperature, in six months; and in cooler lands, from seven to eight months. It is very well adapted to lands where the rainfall is not abundant for it is more drought-resistant than any other variety. The stalk grows more than that of any other corn and generally each stalk bears two ears if the land is ordinary, and three or more ears when the land is very good. Another advantage is that the ears rot less than those of other varieties because, when mature, they are enclosed perfectly by the leaves which do not permit water to enter. The cob is very slender and the grain is long; hence the yield is high. A good yield generally gives 70 kgs. to the hectol. (about 63 lbs. to the bu.) and a very good yield as high as 72 kgs. (65 lbs.) This corn is highly valued because it contains so much starch; when made into meal for use in the preparation of tortillas, it swells a great deal and gives better results than other kinds. As the grain contains less oil than other varieties, it is not good for fattening hogs but is suitable for other animals." (Moreno.)

Notes on Behavior of Previous Introductions.

Mr. J. F. Keltch, of Brayton, Tenn., reports: "The plum, (*Prunus salicina x cerasifera myrobalana*, S. P. I. No. 31652) you sent me three years ago, is the finest I ever saw. The tree bore last summer, and the fruits were extra large, smooth, sweet, and of fine flavor, beautiful in color and appearance. My neighbors all want some of the trees. One fruit man wants 100 or more. The tree is 10 feet tall, with a spread of 12 feet; it is growing in rocky, gravelly soil, and appears to be perfectly hardy on this cold mountai n. "

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones and P. G. Russell, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. M. Rankin, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
J. E. Morrow, Superintendent.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 148. AUGUST, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Achradelpha	1345	Elaeis	1347
Achras	1346	Eleusine	1347
Alectryon	1346	Lawsonia	1347
Amygdalus 1346,	1350	Murraya	1347
Attalea	1346	Pistacia	1350
Bambos	1348	Prunus	1350
Brassica	1349	Zea	1348
Cydonia	1349	Ziziphus	1349
Dovyalis	1350		

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 10, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Achradelpha mammosa (Sapotaceae), 46236. **Mamey sapote.** From Panama, Republic of Panama. Presented by Mr. Ramon Arias-Feraud. "The most important member of the genus is without doubt the **mamey sapote,** a common fruit in Cuba, and not infrequently seen on the Central American mainland. It is said to prefer a deep, rich soil and a rainfall of about 70 inches per annum. The fruit is commonly elliptical, and about 6 inches in length. Within the thick woody skin, somewhat rough and rusty brown on the surface, is the soft melting flesh, of a beautiful reddish salmon color, and of about the same consistency as a ripe canteloupe. The large elliptical seed can be lifted out of the fruit as easily as that of an avocado; it is hard, brown, and shiny, except on the ventral surface which is whitish and somewhat rough. To one unaccustomed to tropical fruits, the flavor of the **mamey sapote** is at first somewhat cloying because of is utter lack of acidity; when made into a sherbet, however, as is done in Havana, it is delicious and sure to be relished at first trial. Although natives of tropical countries commonly eat the fruit while fresh, it is also made into marmalade, or used as a 'filler' in making guava cheese. The Cubans prepare from it a thick jam, known as 'crema de mamey colorado,' which is delicious. The fruits are picked when mature and laid away in a cool place to ripen, which takes about a week. If shipped as soon as picked from the tree they can be sent to northern markets without difficulty, and are occasionally exported from Cuba and Mexico to the United States. The season of ripening is during the summer; in Costa Rica the tree is said to lose its foliage in the dry season, flowering at the same time. The seed contains a large oily kernel which has a strong smell and a bitter taste. According to Pittier, it is used in Costa Rica, after being finely ground, to prepare an exquisite confection; the same authority states that it is sometimes used by the Indians, after being boiled, roasted and ground, to mix with cacao, imparting a bitter taste to the beverage. The foliage of the **mamey sapote** resembles that of the loquat (*Eriobotrya japonica*), except in its lighter color and entire margins. Propagation is by seed, young trees coming into bearing at the age of 5 to 7 years. Before planting it is well to remove the hard outer husk from the seed; it is then easily germinated by planting in light sandy loam, barely covering it with soil." (Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1919.)

Achras zapota (Sapotaceae), 46237. **Sapodilla.** From Panama, Republic of Panama. Presented by Mr. Ramon Arias-Feraud. The sapodilla, native of Central America and the West Indies, is a tree 25 to 30 feet high with thick, leathery, shiny leaves. It bears two crops of fruit annually, in August and February. Gum and tannin are quite abundant in the green fruit. When ripe, the fruit contains a brown, juicy, luscious pulp surrounding the black seeds. The sapodilla thrives up to an altitude of 3,000 feet; in Florida as far north as Palm Beach. The tree is propagated by seed or by grafting, and makes a very slow growth. The latex of this tree is the source of chicle, which is used in the manufacture of chewing gum. The fruit varies greatly in size and flavor. It appears on the markets of Florida and other Gulf States, and occasionally in Washington and New York markets. (Adapted from Wilcox, Tropical Agriculture, p. 136.)

Alectryon subcinereum (Sapindaceae), 46299. From Nice, France. Presented by Mr. A. Robertson Proschowsky. "Seeds from a young tree in my garden. It is the first time this species has flowered. The seeds are surrounded by a juicy, red-colored aril which is edible, and of a pleasant, sweet taste, only it is very small. It is rather ornamental like so many tropical evergreens, and absolutely hardy here. It may, as I expressed in my foregoing letter, serve eventually as stock on which to graft the longan, or the litchi." (Proschowsky.)

Amygdalus persica (Amygdalaceae), 46239. **Peach.** From Pretoria, Union of South Africa. Presented by Mr. I. B. Pole Evans, Chief, Division of Botany, Department of Agriculture. "**Transvaal yellow.** This variety is one of the hardiest we have in this country and the most immune to the more common fungous pests of the peach." (Evans.)

Attalea sp. (Phoenicaceae), 46300. **Coquito.** From Mexico City, Mexico. Presented by Mr. A. L. Herrera. "An undescribed species, closely related to the Cohune, or Corozo, palm (*Attalea cohune*) of the Caribbean coast region of Central America; it differs from the Cohune palm in the smaller and more rounded fruits and the thinner and more brittle shell of the seed. The seed contains a single kernel, smaller than that of the Cohune. The kernels contain a high percentage of oil,

said to be the equal of coconut oil and suitable for the manufacture of similar products. The palm is said to grow in great abundance in the vicinity of Mazatlan, Sinoloa, Mexico. The kernels are exported in considerable quantities from Mazatlan to Pacific ports of the United States for oil extractions." (C. B. Doyle.)

Elaeis guineensis (Phoenicaceae), 46297. **Palm.** From Buitenzorg, Java. Presented by the Chief of the Division of Plant Breeding, Department of Agriculture. "We received this variety from the Belgian Congo in 1914 under the name of **Nsombo B.** The imported seeds were taken from one seed bearer. The plants raised from these seeds were planted out in May, 1915, on a rubber estate, where no other oil palms were near so that they could only fertilize each other. They are now commencing to bear fruit. We can not yet determine the value of the new variety from a commercial point of view." (I. Boldingh.)

Eleusine coracana (Poaceae), 46295. **Ragi millet.** From Beira, Mozambique. Presented by Mr. Wm. Humphreys, Acting Director of Agriculture. "**Ragi millet** is the only variety grown in this territory. It is grown only by natives for food purposes and, with the exception of pearl millet (*Pennisetum glaucum*), is practically the only millet grown here." (Humphreys.)

Lawsonia inermis (Lythraceae), 46241. From Nice, France. Presented by Dr. A. Robertson Proschowsky. An interesting shrub commonly known as Henna Camphire, Cypress shrub or Egyptian Privet, grown throughout India, Persia, Syria, and northern Africa where its powdered leaves are used as a hair dye and as a cosmetic. It imparts a reddish orange color. Plants attain a height of 8 or 10 feet, and bear smooth, oval or lance-shaped, entire leaves, and panicles of small, white, sweetly scented flowers which are used in perfumery. This species is reported as being a very useful and ornamental hedge plant. (Adapted from Watt, Economic Products of India.)

Murraya caloxylon (Rutaceae), 46294. **Katinga.** From Manila, Philippine Islands. Presented by Mr. E. D. Merrill, Bureau of Science, Manila. "A short time ago I received two fruits of this species from Mr. Burkill in Singapore. I am sending you seeds from one of these fruits and I trust that they may reach you

in a viable condition." (Merrill.) A medium-sized tree, with pale flaky bark, native of Siam. The compound leaves are made up of 13 oblanceolate leaflets on a winged rachis. The pale yellowish green flowers are followed by yellow, citron-like fruits, 4 inches in diameter, with a thick skin and green, tasteless flesh. The tree is known as the **katinga,** and is famous in the Malay region for its beautiful wood which is of a light yellow color with dark brown streaks. It is fairly hard and takes a good polish. (Adapted from the Journal of the Straits Branch, Royal Asiatic Society, vol. 50, p. 113.)

Zea mays (Poaceae), 46282 to 46293. **Corn.** From Panama. Presented by Mr. A. H. Verrill. "While in the unexplored portion of Darien district in Panama, I found the 'wild' Indians of the 'forbidden' country raising a number of interesting varieties of corn. These are all 'fixed' among the Indians and come true to seed; several are used as sweet corn. These Indians consider corn sacred, and use great care in keeping the various kinds separate." (Verrill.)

Notes on Behavior of Previous Introductions.

Mr. H. Nehrling reports the following in a letter dated December 24, 1918: "*Bambos tulda* has again made a fine dense growth, but the culms are only about half the usual size. They are, however, very dense and vigorous, and if we do not have another killing freeze this winter the clumps will be in perfect condition again next season. I measured my tallest culm (that froze down early in 1917) a few days ago and found that it was 67 ft. 2 in. tall from bottom to tip — an immense size. The next tallest measured 55 ft. 4 in. I have cut them up and am using them in place of laths on my lath-houses. As they are perfectly straight, they serve the purpose well. This species is such a useful plant, and so extremely beautiful, that it should be planted extensively all over south Florida. In central Florida, and in other places where the orange tree grows well, it should be made use of as an ornamental. It is the most luxuriant and imposing of all my bamboos. It grows exceedingly well on high and dry pineland, scarcely needing any care. With good care it grows more vigorously than any other species. Some good commercial fertilizer, rich in ammonia and phosphoric acid, should be applied annually, and potash

is necessary to give the culms the necessary hardiness and consistency, so that they can be used for manufacturing purposes. Stable manure applied as a mulch is also very beneficial. I am very much interested in this most beautiful and valuable economic species, and if I could get a few additional small plants for my Naples place I would be very much obliged to you. *B. tulda* evidently does not grow well on moist land. In drained, flat-wood soil it grows very well indeed. You are doing well in disseminating this bamboo widely over south Florida, and I hope that it soon will be found in all the gardens and parks of this region."

In a letter dated Dec. 17, 1918, Forest E. Grow, of Eagle Rock, California, reports: "*Ziziphus jujuba*, S. P. I. No. 17752, planted Feb. 1, 1916. The fruits were uniformly larger this year, and the tree bore a heavy crop, which was all dried and stored away for winter use. *Z. jujuba*, S. P. I. No. 30488, planted Feb. 15, 1917, produced about 125 fruits this season. The fruits are of medium size. When processed they have a very rich flavor and fine texture; they dry perfectly. *Z. jujuba*, S. P. I. No. 22686, planted Mar. 5, 1918, produced about 85 fruits. They dry perfectly. When processed, they are of large size, and have a good flavor and texture but not equal to those of S. P. I. No. 30488. All of the jujube fruits we found useful and delicious prepared as follows: processed fruits - similar to dates; syrup - superior in flavor and color to maple syrup; paste - excellent; stewed - after the fruits have been peeled; baked in bread - the fruits being previously peeled and stewed - superior to raisin bread.

Cydonia oblonga S. P. I. No. 33214, **Quince**, planted Feb. 1, 1916, the tree produced its first crop, of 145 fruits, this fall. Two types or shapes were noticeable: one round, the other oblong, of medium size. All who sampled this fruit spoke of the following qualities: smooth surface (easily prepared for use); mellowness (cooks tender like an apple); freedom from usual grittiness; mild, pleasant flavor; good keeping qualities (five fruits in perfect condition, Dec. 17, 1918)."

"Mr. J. R. Lawrence, North Leverett, Mass., writes as follows, Dec. 16, 1918: "*Brassica pekinensis*, S. P. I. No. 44292. **Pai ts'ai.** Planted August 7, it was harvested from September 12, up to the last of October. The heads are large and loose, like loose lettuce, weighing

from 5 to 8 pounds. It is much more delicate in flavor than common cabbage and is delicious when cooked with a 'boiled dinner.' The midrib, when cooked like the rib of Swiss chard or, like asparagus, with cream sauce, is also fine. It should find a ready sale in the markets as a new and pleasing vegetable. Pulled and hung up by the roots, it keeps well in a cool cellar."

A letter from G. T. Bosky, Nov. 3, 1918, contains the following report: "*Dovyalis caffra* (**Kei-apple**) S. P. I. No. 34250, that you sent me about four years ago, fruited last July. It is a very good fruit for jams or jellies. The plant will grow in any garden or yard, not requiring any cultivation at all; it will stand hot sun without any sign of needing care. I am glad to recommend it for this country, from southern California to San Francisco."

Mrs. O. T. Kelton, McDade, Texas, in a letter dated November 3, 1918, reports: "*Prunus sp.*, S. P. I. No. 31652. This tree is very thrifty and fruited this year. It is a very abundant bearer and the fruit is the finest ever seen growing in this county. It began to ripen May 15, and continued until about the first of June."

R. Bates, of Jackson, S. C., wrote as follows, January 1, 1919: "The two **Chinese pistaches** (*Pistacia chinensis*, S. P. I. No. 42823) which you mailed me last March, are thriving and seem to be well adapted to this region. S. P. I. No. 33224, *Prunus domestica* (**Plum**, variety **Ciruela de Fraile**) is the most vigorous plum of this species that I have ever tested from any source. It is nothing to get trees 6 to 8 feet high from a root graft in a single season. The tree seems perfectly hardy with healthy foliage during the whole summer, and disease-resistant bark. S. P. I. No. 33219, *Amygdalus persica* (**Vainqueur peach**) is growing fine and is well set with fruit buds."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 149. SEPTEMBER, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Amygdalus	1358	Helianthus	1358
Buddleia	1358	Jasminum	1358
Canna	1353	Persea	1355
Carica	1353	Phalocallis	1358
Chenopodium	1353, 1356	Phaseolus	1355
Citrus	1354	Pittosporum	1355
Freycinetia	1354	Solanum	1355
Garcinia	1354	Zea	1356

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 17, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Canna edulis (Cannaceae), 46313. **Edible canna.** From Hawaii. Presented by Mr. J. M. Westgate, Hawaii Agricultural Experiment Station, Honolulu. An herbaceous perennial with purple stems 8 to 12 feet high, found in the West Indies and South America. The large leaves are green or bronze and the small red flowers are usually in pairs in a lax raceme. Starch is procured from the thick, edible rootstock and for this purpose the plant is widely cultivated in the tropics. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 2, p. 657.) "The cultivated canna grows like a weed on the everglade soils of southern Florida and it is well worth trying this starch-producing crop there in comparison with the Bermuda arrowroot (*Maranta arundinacea*)." (Fairchild.)

Carica sp. (Papayaceae), 46321. From Mexico. Presented by Mr. Harry Hummel, Tampico. "**Papaya broncho.** This is the ever-blooming papaya and produces a fruit about 3 inches long and 2 inches in diameter. The trees grow wild in the woods, can be transplanted at any time of the year, require no attention except watering, and I believe if cultivated will produce a larger fruit." (Hummel.)

Carica papaya (Papayaceae), 46334. **Papaya.** From Mexico. Presented by Mr. Harry Hummel, Tampico. "**Papaya real.** The fruit from which these seeds were taken was 14 inches long and 6 inches in diameter. It is the very best papaya that grows in the Tampico district and is a delicious fruit equal to any muskmelon. The trees grow in sandy loam in a climate which very seldom goes below 40° F. and reaches as high as 110° F." (Hummel.)

Chenopodium nuttalliae (Chenopodiaceae), 46311. From Mexico. Presented by Mrs. Zelia Nuttall, Coyoacan. "Seeds of **huauhtzontli,** the unripe inflorescence of which is a favorite vegetable of the Mexican Indians. It is boiled or fried in butter - stem and all - small flowering tips being selected and tied together. Much used in Lent. It is very nourishing and palatable. The seeds must be in the milk (like corn, - half ripe). Combines vegetable and cereal." (Nuttall.) "Native name, **xochihuauhtli,** (flowering huauhtli). A plant cultivated near the City of Mexico for the sake of its prolific branching inflorescences, which are gathered before they are quite mature and while the seeds are still soft,

and cooked as a vegetable with other ingredients. This variety, with yellowish or pale brown discoid seeds, is the most popular. The inflorescences are known by the Aztec name **huauhtzontli**, signifying 'hauhtli-heads'. Botanically the plant is closely allied to *Chenopodium paganum* and *Chenopodium album.* It is quite distinct from *Chenopodium quinoa*, the celebrated food-staple of the Peruvian highlands; and it must not be confused with the plant called **michihuauhtli** (fish-egg hauhtli) which is a white-seeded Amaranthus, not a Chenopodium." (W. E. Safford.)

Citrus grandis (Rutaceae), 46336. **Pummelo.** From Shenchowfu, Hunan, China. Presented by Mr. N. T. Johnson American Consul, Changsha, China, who received them from Rev. J. Frank Bucher, Shenchowfu. "Red-fleshed pummelo. Ripens earliest of all the pummeloes on our compound. It is at least two months earlier than other varieties." (Bucher.)

Freycinetia banksii (Pandanaceae), 46317. From New Zealand. Presented by Mr. H. R. Wright, Auckland. "The fruit proper does not ripen until many months after the ripening of the white bracts. In size and shape it is almost identical with *Monstera deliciosa.*" (Wright.) A vine which climbs to the tops of the tallest trees along the banks of rivers in the North Island of New Zealand. The linear-lanceolate leaves are borne in clusters along the stem and the flowers appear in the center of these leaf-clusters. It is called **Lon marrar** by the natives, who eat the white fleshy bracts of the flowers for their sweet sugary juice. (Adapted from Hooker, Companion to the Botanical Magazine, vol. 2, p. 377.)

Garcinia mangostana (Clusiaceae), 46306. **Mangosteen.** From Buitenzorg, Java. Presented by the Director, Department of Agriculture. One of the most delicious fruits of the tropics. The handsome tree is 25 to 30 feet in height, of compact growth, regular in outline, and with dark green foliage. It comes into bearing at about the ninth year. The rose-pink flowers are 1½ inches across, and there are two blooming periods each year. The round fruits, about the size of a mandarin orange, are borne from buds produced near the tips of short branches, mainly on the outside of the tree. The rind is thick and the flesh divided into segments much like the orange. The texture resembles a well-ripened plum, and the taste is delicious. In the East Indies

it is planted by the natives as a dooryard tree. It is very hard to establish the young trees which accounts for the small plantings which have been made. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 4, p. 1889-90.)

Persea americana (Amygdalaceae), 46337. **Avocado.** Grown at the Plant Introduction Field Station, Miami, Fla. A Mexican avocado, which has proved quite frost-resistant. This variety is a seedling grown from seed received under S. P. I. No. 19094. The fruit ripens at Miami during the months of August, September and October. It is pear-shaped and of a purplish maroon color, weighs 11 to 12 ounces, and is of fair quality.

Phaseolus lunatus (Fabaceae), 46304. **Lima bean.** From Paraguay. Presented by Mr. Thomas R. Gwynn, Concepcion. "The Linconia butter bean is the very finest that I have ever come across. It yields in full blast for at least eight months and with a good season will give, in a climate like this, a year or more in superabundance continually, day after day. The plant is extraordinarily hardy and thrifty, as neither the extreme drought nor the hard frosts of last year put it out of business. When I pulled the plants September first they were still bearing (not a great deal). I planted this year September fifteenth, and as we had a splendid year the plants are extra fine and are loaded with fruit of all sizes, and flowers to the very tip ends. I have them planted along a wire fence with poles 12 feet high stuck in about one yard apart." (Gwynn.)

Pittosporum ralphii (Pittosporaceae), 46319. From New Zealand. Presented by Mr. H. R. Wright, Auckland. A laxly branched shrub 15 to 20 feet high, found in the central district of the North Island of New Zealand. The shoots, sepals, and under surface of the coriaceous leaves are covered with close white hairs. The fascicles of small bell-shaped, dark crimson flowers, with protruding yellow anthers resting on the downy white young leaves, make it a very attractive ornamental shrub. (Adapted from Laing and Blackwell, Plants of New Zealand, p. 195.)

Solanum mammosum (Solanaceae), 46374. **Susumber.** From Porto Rico. Presented by Prof. C. S. Sargent, Arnold Arboretum, Jamaica Plain, Massachusetts. Collected by Mr. Sylvester Baxter. "In Jamaica, difficulties

to a healthy maturity have been met by grafting them on *Solanum mammosum*, the so-called **susumber tree**, a rank, tropical weed closely related botanically to the egg-plant. The grafts are said to produce fruits of large size and fine flavor, and as the stock is perennial, bearing is continual." (Contributions of the U. S. National Herbarium, vol. 8, p. 242.)

Zea mays (Poaceae), 46314. **Corn.** From Mexico. Presented by Mr. Arnulfo Ballesteros, La Barca, Jalisco, at the request of Mr. John R. Sillman, American Consul, Guadalajara. "Early **Pipitillo corn**, which is cultivated in the swampy lands of Chapala. This corn is early in this region only when sown in the months of January, February, and the early part of March. It is then possible for the harvesting and drying to be completed four months afterward. If, on the other hand, it is sown in May or June, the time required for it to mature is six months." (Ballesteros.)

Notes from Correspondents.

A letter dated September 13, 1918, from Mr. H. Tisell, of Orange Center, Orange County, Florida, contains the following translation of an article on **Rismollan**, "Svenskt Land," December 15, 1917, p. 338. Believing that the article will prove of interest to our collaborators, we are quoting it entire.

Rismollan. A Newly Discovered Utility Plant.

"That necessity is the mother of invention is found more and more true in our days.

"In all walks of life the human intelligence is trying to procure substitutes for all that the world war has forced us to do without. What we especially have great need of is bread and more bread. The cultivation of bread grains has fortunately increased, but not sufficiently to fill our needs. It has therefore been necessary to mix all kinds of possible and impossible substances with the flour to make it go farther.

"In Skane (the most southern district of Sweden), a farmer, Ernst A. Larsson, Filborna, Halsingborg, has drawn attention to a very fruitful plant: Rismollan (*Chenopodium quinoa*), the grain of which can be milled into flour and cooked as porridge. The leaves provide a tasty 'spinach.'

"Mr. Larsson himself tells that during the winter

of 1916-17, he read an article in a horticultural paper about Rismollan and its phenomenal seed capacity. He became so much interested that he decided to procure some seed for a trial planting. This, however, was found to be easier said than done. In Sweden none was to be had, and the wide-awake Germans had taken the Rismollan in hand and would not spare any of the valuable seed. Finally Mr. Larsson succeeded in obtaining a small amount of seed from the Botanical Garden in Copenhagen. He planted half the seed in the open, April 15; but the soil had not a sufficiently high temperature and the plants were small and weak. The second half was planted May 2, when the soil was sufficiently warm; the seed sprouted well, and the plants developed during the summer into real bushes, 2 m. (6 ft. 6 in.) tall.

"For best results, the seed should be planted in hills; when the plants are 10 cm. (4 in.) in height they should be thinned out and the strongest left in each hill.

"The grain ripened in the middle of September and yielded approximately 100,000 grains which must be considered an extraordinary result. The seeds are very easily threshed out; they fall from the seed stalks when rubbed between the hands.

"An analysis made at the Central Institute of Stockholm is as follows:

Water		11.56 %
Raw protein		14.88 "
Raw fat		5.84 "
Starch	52.67	
Other nitrogen-free extracts	8.90	
Fiber	2.86	
		64.43 "
Ash		3.29 "
		100.00 %
Pure protein		12.63 %
Amido bodies		2.25 "
Soluble albumen		10.06 "

"Rismollan comes from the plateaus of South America. Since olden times it has been cultivated in Chile and Peru, where it serves millions of people as food and has as great importance and use as the potato. Like everything else pertaining to agriculture, this plant was the object of religious rites and was cultivated

with the greatest care by the Incas.

"In Germany, where every means must be used for securing food for the people, there are this year large plantations; also in Austria, and in the occupied portions of Belgium, France, and Russia.

"Next year Mr. Larsson expects to be able to plant at least one-half hectare (nearly 2½ A.) with Rismollan and this will mean a considerable increase in the production of food . . . "

Notes on Behavior of Previous Introductions.

Mr. Adolf K. Polansky, Lyons, Texas, reports as follows, in a letter dated January 5, 1919:

"*Amygdalus persica*, S. P. I. No. 24807, grew 4 feet tall last year and looks very healthy and strong, although the entire year was hot and dry.

"*Jasminum floridum*, S. P. I. No. 38154, is another fine evergreen shrub which should be in every yard. The handsome green foliage and branches, and showy yellow flowers were not injured by a severe freeze in December, 1918. The plant is always full of flowers.

"*Helianthus angustifolius*, S. P. I. No. 44103, does very well; it begins to bloom about the middle of August, and blooms until killed by the frost. It has large masses of beautiful yellow flowers."

Mr. F. A. Ward, writes, October 28, 1918, from Cortland, New York:

"*Helianthus angustifolius*, S. P. I. No. 44103, thrives exceedingly well; blooms freely and matures plenty of seed. The chickadees are very fond of the seeds, and I would suggest it as a good plant to attract birds in the fall and early winter."

Mrs. W. J. Tinnin, of Fresno, California, reports in a letter dated October 13, 1918:

"*Phalocallis herberti*, S. P. I. No. 33997, the yellow iris bulb from Argentina, has done wonderfully well. It blossomed from June 8 to July 19. I have only 5 bulbs; it is very satisfactory.

"*Buddleia davidii*, S. P. I. No. 30806, we have distributed to dozens of people, and have several large bushes in bloom from early summer until frost comes."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. Harry Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 150. OCTOBER, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Aphloia	1361	Macadamia	1364
Azadirachta	1361	Myrica	1364
Belou	1361	Nymphaea	1364
Brabejum	1361	Pandorea	1364
Cajan	1362	Persea	1364
Ceiba	1362	Phormium	1365
Crataegus	1363	Prunus	1365
Dacrydium	1363	Quercus	1366
Dammara	1363	Swainsona	1366
Ipomoea	1364		

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

March 25, 1919.

Anyone desiring to republish any portion of this circular should obtain permssion by applying to this Office.

Aphloia theaeformis (Flaccurtiaceae), 46389. From Tamatave, Madagascar. Presented by the Envoi de la Station Experimentale d'Agriculture du Government Ivoloina. A low tree found on the slopes of the mountains in Madagascar. The small white berries, which literally cover the tree, are edible and very wholesome although slightly bitter. The leaves are said to possess medicinal virtues. (Adapted from Heckel, Plantes Utiles de Madagascar, p. 256.)

Azadirachta indica (Meliaceae), 46573. **Neem tree.** From India. Seeds presented by Mr. G. T. Lane, Curator, Royal Botanic Garden, Sibpur, near Calcutta. A large tree, sometimes 50 feet tall, native of India. The pinnate leaves are made up of 9 to 15 ovate, serrate leaflets. The white, fragrant flowers hang in graceful panicles and are followed by clusters of ovoid, dark purple drupes the size of an olive. The wood resembles mahogany and takes a beautiful polish. It is used in making furniture, carts, ships, agricultural implements, and Hindu idols. The sap is used in the spring in making a cooling drink. A gum, which exudes from the bark, is used as a stimulant. Margosa oil, extracted from the pulp of the fruits by boiling or by pressure, is an acrid, bitter oil used in medicine and in dyeing. The seeds are employed in killing insects. (Adapted from Brandis, Forest Flora of India, p. 67.)

Belou marmelos (Rutaceae), 46477. **Bael fruit.** From Shahjahanpur, India. Presented by Mr. N. L. Rockey, District Superintendent, Methodist Episcopal Church. "The **bael fruit** grows plentifully in India. It is prized as a fruit from which to make sherbet. Some of the fruits are very fine; others are useless. It has the flavor of concentrated peaches. The fruit is extremely valuable in the treatment of dysentery, as it is a mild astringent. At the same time it is a food." (Rockey.)

Brabejum stellatifolium (Proteaceae), 46474. From Pretoria, South Africa. Presented by Mr. I. B. Pole Evans, Chief, Division of Botany, Department of Agriculture. A shrub or small tree 8 to 10 feet high, found in the western part of South Africa. The purplish twigs bear lanceolate, serrate, coriaceous leaves in whorls of six. The white, sweet-scented flowers are borne in dense, axillary racemes, 3 to 6 inches long, and are followed by ovoid, densely velvety fruits, 1 to 2 inches long, each containing a single seed. The seed may be

eaten after prolonged soaking in water. The red, reticulated wood is used for joiners' and turners' ornamental work. (Adapted from Thiselton-Dyer, Flora Capensis, vol. 5, p. 504.)

Cajan indicum (Fabaceae), 46480. **Pigeon-pea.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. **Frijolito garbanzo.** "The pigeon-pea, or **guandu,** supposed to be a native of India, is cultivated widely for food in the tropics and subtropics. It is perennial in frostless regions, but is usually cultivated as an annual. The plant develops into a large, semi-woody bush reaching a height of from 5 to 10 feet. Although the skin of the pigeon-pea is a little tough the flavor of the peas is good. In India this vegetable is commonly called **dhall** or **dahl.**" (Young.)

Mr. H. V. Krishnayye, Officiating Director of the Mysore Department of Agriculture, states that in preparing **dhall** for the market it is soaked for twenty-four hours in puddled red earth and then dried. In the removal of the dried earth the skin, or husk, of the seed also comes off. The product is then ready for market. This letter contains the following further statement: "The pulse as it is sold in the market is dehusked and split and is ready for cooking without further treatment. **Dhall** enters into the composition of many Indian dishes, where it supplies the nitrogenous constituents in a vegetarian ration, but these will probably not be relished by non-Indian palates. However, I think it is safe to say that **dhall** could be substituted for lentils in all your dishes with satisfactory results."

"Krauss, of Hawaii, reports that an excellent forage is secured there from pigeon-peas by lopping off the tops and drying them with the peas attached and then reducing these tops to meal. He asserts that this rivals alfalfa meal in food value." (Fairchild.)

Ceiba pentandra (Bombacaceae), 46522. **Kapok.** From Mexico. Presented by Mr. John R. Silliman, American Consul, Guadalajara. "The **kapok** tree, native in the American tropics, is widely distributed in the tropics of both hemispheres. It attains a height of from 75 to 100 feet with wide-spreading horizontal branches, making an attractive ornamental or shade tree. It is often, planted along the borders of fields for fence posts. It begins to bear seed pods with down, when about five years old and the yield of pods increases with the age of the tree. Well-developed trees under favorable

conditions yield about 7,000 pounds per acre. **Kapok** cannot be spun but it is an excellent material for pillows, mattresses, life preservers, etc., and its use is rapidly increasing." (L. H. Dewey.)

Crataegus mexicana (Malaceae), 46481. **Hawthorn. Tejoiote.** From Zacuapam, Mexico. Presented by Dr. C. A. Purpus. The tree is bushy, 8 to 10 feet in height with glabrous, olive-colored branches. The leaves are oblong, attenuated at the base, and 2 to 3 inches in length. The abundant flowers are borne in terminal corymbs. The fruit is larger than is usual among the hawthorns. The color when ripe is pale yellow, dotted with brown. It is a native of the table-lands of Mexico, and has been found quite hardy in England. (Adapted from The British Flower Garden, 1835, p. 300.)

Dacrydium cupressinum (Pinaceae), 46575. **Rimu.** From Auckland, New Zealand. Presented by Mr. H. R. Wright. "Prettiest of all our native trees; a real treasure." (Wright.)

"This pine is one of the most beautiful objects in the New Zealand bush. Its pale green, drooping branches differ from those of any other forest tree. The leaves are only small prickles, running up a long stem, from which branch out other small stems whose united weight causes the main stem to hang like the branches of the weeping willow. The whole tree, when young, has the appearance of a Lycopodium. The fruit is tiny, but beautiful, the nut being blue-black and the cup red. The timber is of a red or yellow color and beautifully marked. It is used to great advantage in dadoes, panels, and for ceilings. The **Taranaki rimu** is especially straight in the grain and very resinous. It is much used for bridge-building in that district." (Laing and Blackwell, Plants of New Zealand, p. 74.)

Dammara australis (Pinaceae), 46387. **Kauri pine.** From New Zealand. Presented by Mr. J.W. Poynton, Palmerston North, New Zealand. This magnificent tree, native of New Zealand, sometimes measures 180 feet in height and 17 feet in diameter, the estimated age of such a tree being 700 to 800 years. It furnishes an excellent, straight-grained, remarkably durable timber which is much used in boat and bridge-building, for furniture and wagon-making. This tree also yields the **kauri** resin from which an almost colorless varnish is made. (Adapted from Mueller, Select Extra-Tropical Plants, ed. 9, p. 161.)

Ipomoea sp. (Convolvulaceae), 46460. From Burringbar, New South Wales. Presented by Mr. B. Harrison. "Native Ipomoea with large, purple flowers and handsome, laciniated foliage. Would make a good ornamental. A perennial vine with tuberous root." (Harrison.)

Macadamia youngiana (Proteaceae), 46463. **Thin-shelled Queensland nut.** From Burringbar, New South Wales. Presented by Mr. B. Harrison. "Very rare here." (Harrison.)

A shrub 8 to 10 feet high with oblong leaves in whorls of three or four and with nuts resembling those of *M. ternifolia*, but with thinner shells. (Adapted from Bentham, Flora Australiensis, vol. 5, p. 406.)

Myrica rubra (Myricaceae), 46571. From Canton, China. Seeds presented by Mr. G. Weidman Groff, Canton Christian College. "**Shui yeung mui.** A very interesting, plumlike fruit, common on the market of Canton in the month of May. This fruit makes a most attractive appearance and it is always marketed with the dark green leaves attached to the fruit. In general appearance it is not unlike a strawberry but more rounded. It has a roughened skin and is quite acid in taste. There is but one seed, which is difficult to detach from the flesh. July 18, 1918." (Groff.)

Nymphaea gigantea (Nymphaeaceae), 46464. **Water-lily.** From Burringbar, New South Wales. Presented by Mr. B. Harrison. "The large beautiful blue water-lily of the northern rivers of New South Wales." (Harrison.)

Pandorea australis (Bignoniaceae), 46384. From Sawtelle, California. Presented by Mr. P. D. Barnhart. "The most wonderful of all climbing plants grown on this coast. It is a rampant grower with dark, shining green foliage. The flowers are a light cream spotted with chocolate. The whole show is over in about two weeks, but during this time the flowers are profusely abundant." (Barnhart.)

Persea americana (Lauraceae), 46574. **Avocado.** From Mexico. Presented by Mrs. Zelia Nuttall, Coyoacan. "When Mr. Popenoe was here recently, he asked me what variety of **aguacate** I regarded as the best I had ever tasted, either here or in any other country. I told him that I considered a certain kind grown on my own place, Casa Alvarado, the finest in flavor and creaminess; besides, the skin was so thin that it could be

peeled off as easily as that of a ripe peach. He tried the first ripe ones of this year's crop and was delighted with them; he asked me to send him large quantities of seeds." (Nuttall.)

Phormium tenax (Liliaceae), 46388. **New Zealand flax.** From New Zealand. Seed presented by Mr. J. W. Poynton, Palmerston North, New Zealand. "The yield is about one ton of fiber from eight tons of green leaves. The nonfibrous part of the leaves, stripped from the fiber, has a lot of protein material in it and some sugar and starch. Cattle eat the cut-up leaves greedily. If the waste were dried it would probably make a good cattle feed. When decayed, it makes an excellent fertilizer. Analyses have shown a high percentage of potassium salts in the ash." (Poynton.)

Prunus mume (Amygdalaceae), 46572. **Japanese apricot.** From Canton, China. Seeds presented by Mr. G. Weidman Groff, Canton Christian College. "These fruits, known on the Chinese (Cantonese) markets as **Hang mui**, are quite common in Canton in the month of May. The fruit is somewhat like an apricot. It is said that there are several different types. A bitter principle exists in these particular fruits, but they make a very fine jelly. This number has possibilities as a cultivated fruit or as a stock." (Groff.)

"Although every American artist who visits Japan in the early spring comes away with the keenest appreciation of the remarkable beauty and picturesque character of the so-called 'flowering plums' of Japan, few of these artists appear to know anything about the fruit which is borne by these beautiful flowering trees. These fruits, which are properly classed by botanists with the apricots instead of the plums, constitute a most unique food of the Japanese. Though sometimes eaten fresh, much in the same way as we eat our native American plums, they are usually pickled in brine and colored with the colored leaves of the perilla plant and packed in boxes or other receptacles for household use. Great quantities of these pickled mumes are consumed in Japan. Their use is so universal that they formed an important part of the army ration in the Russo-Japanese war and it is said that they were often depended on to quench the thirst of the soldiers when on long marches. One's first impression of these Japanese pickles may be properly compared with one's first impression of the Spanish pickled green olive, which

has now become so popular. Eaten with meats, they furnish an entirely new and appetizing flavor; one which, perhaps, is destined to become popular in America, - certainly one which deserves our investigation. The trees are very hardy and there are a great many varieties; when in flower they are very beautiful. Our horticulturists should study them." (Fairchild.)

Quercus sp. (Fagaceae), 46383. **Oak.** From Guatemala. Presented by Mr. E. Reeves, Finca "El Tambor," San Felipe, Retalhuleu, at the request of Dr. Wm. Trelease, of the University of Illinois. "Fruits of a large-fruited oak that grows a few miles from here." (Reeves.)

"I am glad that Mr. Reeves got to you viable seeds of his fine oak - which I thought you would like. It is between *Q. corrugata* and *Q. cyclobalanoides* in characters but very distinct from both." (Trelease.)

Swainsona sp. (Fabaceae), 46457. From Australia. Presented by Mr. J. A. Hamilton, Tolga, Queensland. "Seeds of a perennial vetch. The plant seems very drought-resistant, as it is green all the time. It holds its own among the native grasses and is green when they are dried up, so it must root very deeply. This ought to prove a very valuable fodder crop in semi-tropical areas, especially in drier parts. It grows in very porous, well-drained soil." (Hamilton.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 151. NOVEMBER, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	S.P.I. No.	Page
Canarium	(46487)	1369
Copernicia	(46561)	1369
Eruca	(46501)	1369
Madhuca	(46535)	1369
Normanbya	(46531)	1369
Pahudia	(46488)	1370
Prunus	(46533), (46534)	1370
Pyrus	(46566)	1370
	(46576 to 46587)	1371 to 1374
Trichosanthes	(46642)	1374

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

April 2, 1919.

Anyone desiring to republish any portion of this circular should obtain permssion by applying to this Office.

Canarium luzonicum (Balsameaceae), 46487. From Philippine Islands. Collected by Mr. N. Catalan, College of Agriculture. "Seeds collected from Mt. Maquiling, Los Banos. The tree is a source of the 'brea blanca' of commerce. The stone of the fruit contains an oily endosperm which is very good to eat. The plant occurs in the forest in lower elevations." (Catalan.)

Copernicia cerifera (Phoenicaceae), 46561. **Wax palm.** From Pernambuco, Brazil. Presented by Mr. H. M. Curran. A palm, 25 to 30 feet high, with fan-shaped, rather finely cut leaves 2 to 3 feet in diameter. The wax is extracted by drying the leaves in the sun, when the wax appears in the form of a powder. The fruit is valued for hog feed. The trunks are extensively employed in building houses. (Adapted from description of S. P. I. No. 37866, by Dorsett, Shamel, and Popenoe.)

Eruca sativa (Brassicaceae), 46501. **Roquette.** From Sibpur, Calcutta, India. Presented by Mr. A. T. Gage, Director, Royal Botanic Gardens. Roquette, or rocket-salad, is a low-growing plant, from southern Europe, the leaves of which resemble those of radish and turnip. It is much used by the French as a spring and autumn salad and pot-herb. The flavor of the young, tender leaves bears a strong resemblance to that of horse-radish. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2981.)

Madhuca indica (Sapotaceae), 46535. **Mahwa.** From Saharanpur, India. Presented by Mr. A. C. Hartless, Superintendent, Government Botanic Gardens. "A large, deciduous tree from northern India, cultivated widely in India for its cream-colored, fleshy, sweet corollas, which are dried for eating and for the manufacture of spirits." (Stuntz.)

Normanbya merrillii (Phoenicaceae), 46531. **Palm.** From Manila, P. I. Presented by Mr. E. D. Merrill, Acting Director, Bureau of Science. "**Bonga de China** or **Bonga de Jolo.** A medium-sized palm, with graceful, somewhat curved, pinnate leaves, resembling the common betel nut palm, but not so tall. The leaves are rather glaucous, and the pretty crimson fruits are borne just below the leaves in medium-sized bunches, — the individual fruits are less than one inch long. This palm thrives remarkably well in Manila." (Merrill.)

Pahudia rhomboidea (Caesalpiniaceae), 46488. From Philippine Islands. Collected by Mr. N. Catalan, College of Agriculture. "**Tindalo.** Seeds collected from Mt. Maquiling, Los Banos. A tree that usually occurs in somewhat open situations of low elevations. The wood is very durable and beautifully colored; used for finer constructions; one of the best Philippine woods." (Catalan.)

Prunus serrulata sachalinensis (Amygdalaceae), 46533. **Sargent's cherry.** From Jamaica Plain, Mass. Presented by Dr. C. S. Sargent, Arnold Arboretum. A handsome large tree, of great ornamental value; hardy as far north as Massachusetts, and bearing profusely in early spring, handsome rose-pink single flowers. (Adapted from Bailey, Standard Cyclopedia of Horticulture, vol. 5, p. 2839.)

Prunus tomentosa (Amygdalaceae), 46534. **Bush cherry.** From Jamaica Plain, Mass. Presented by Dr. C. S. Sargent, Arnold Arboretum. This broad, vigorous shrub from northern China, is one of the earliest cherries to flower. The flowers are large, with the white petals more or less tinged with red towards the base; and the small, bright red, slightly hairy fruits are of good flavor. (Adapted from Arnold Arboretum Bulletin of Popular Information, No. 19.) "The plant thrives and fruits abundantly from Georgia to Canada. The ripe fruits make a delicious jelly." (Bisset.)

Pyrus communis x serotina (Malaceae), 46566. **Pear.** From Avery Island, Louisiana. Cuttings presented by Mr. E. A. McIlhenny. "This pear originated in the orchard of Mr. E. A. McIlhenny, Avery Island, La. Mr. McIlhenny has a LeConte orchard, 8 or 9 years old, propagated from trees made from cuttings. The original trees from which the cuttings were taken have been lost. Eight trees in the LeConte orchard are of the new type and differ materially from the Leconte trees. The new type is spreading in habit, and has roundish fruit about as large as a medium-sized apple. The fruit is of fair quality, comparing favorably with LeConte. It is believed that the 8 trees are bud sports from a limb or branch from which the original cuttings were taken. The fact that there are only 8 trees would indicate that there was a limited amount of wood. This pear is of interest because up to this time it has been practically free from fire blight, while the LeConte trees in the same orchard have blighted badly." (B. T. Galloway.)

Pyrus phaeocarpa (Malaceae), 46582. **Pear.** From Korea. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 36.** A pear which is used as a rootstock for cultivated pears at Seoul, Korea. This type produces its fruit in clusters of from 3 to 8. The pears are from one-half to three-fourths of an inch in diameter, roundish, or short-turbinate in shape, brown or russet in color, and with 3 (or rarely 2 or 4) covered cells or seed cavities. The trees which I saw were still young and from 6 to 12 feet high. The young shoots are densely pubescent. The leaves are of medium size and the margins are crenate or bluntly serrate. These trees had evidently grown up from the rootstock of some cultivated varieties of pears. Of no value except possibly as stock in this country." (Reimer.)

Pyrus serotina (Malaceae), 46583. **Pear.** From Japan. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 38. Imamura Aki.** Obtained at Yokohama, Japan. This is one of the best varieties of pears in Japan and Korea. It is a large, russet pear, and distinctly ovoid in shape. The fruit ripens late in the fall, and in the early winter it is in the best condition to be eaten. In quality it ranks with the best Japanese pears." (Reimer.)

Pyrus serotina (Malaceae), 46584. **Pear.** From Japan. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 39. Meigetsu.** Obtained at Yokohama, Japan. This is considered the very finest pear in Japan and Korea. It is a very large pear, oblong or oblong-elliptical in shape, and of a bright russet color. The tree is very vigorous and productive. It should be thoroughly tested in this country especially for blight-resistance." (Reimer.)

Pyrus sp. (Malaceae), 46576. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 51. Mi Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. This is a roundish, medium-sized pear, about 2 inches in diameter. It is yellow in color, and the calyx is deciduous. The flesh is firm and juicy, and the grit cells are not noticeable. The flavor is

sweetish and the quality only fair. In some places in northern China this pear has proved to be the most profitable variety." (Reimer.)

Pyrus sp. (Malaceae), 46577. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 52. Tang Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. This is a large pear, ovate or ovate-oblong in shape, and of a russet color. The calyx is deciduous. The flesh is firm and the grit cells are not noticeable. The flavor is sweet and of fair quality. This is an interesting variety, since it shows some of the characteristics of *P. ussuriensis,* especially in leaf characters, while the russet color of the fruit is not characteristic of this species. It may be a hybrid with *P. ussuriensis* as one of the parents." (Reimer.)

Pyrus sp. (Malaceae), 46578. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 53. Fo Chien Hsi.** Obtained at Mao Shan, near Malanyu, Chihli, China. This pear is of medium size, slightly flattened, yellowish in color, and with the calyx deciduous. The flesh is hard, juicy, and rather sweet. It is an excellent keeper and shipper. Highly regarded in northern China." (Reimer.)

Pyrus sp. (Malaceae), 46579. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 55. Ma Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. This flat pear is medium to large, yellow in color, russet toward the base, and covered with small, light dots. It has a deciduous calyx and the stem is of medium length. The flesh is firm, rather coarse, sweet, and fair in quality. It ripens the latter part of August in northern China." (Reimer.)

Pyrus sp. (Malaceae), 46580. **Pear.** From northern China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 58. Yarh Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. This is the most widely grown pear in northern China. It is of large size, and resembles Bartlett in shape. It has a beautiful, clear, light yellow color. The flesh is firm, juicy, and sweet, and free from grit cells. This pear possesses extraordinary

keeping qualities, and can be purchased at any time throughout the entire winter. It is in best condition to be eaten during the latter part of winter and early spring." (Reimer.)

Pyrus sp. (Malaceae), 46581. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 59. Hung Li,** or 'Red Pear.' Obtained at Mao Shan, near Malanyu, Chihli, China. This pear is of medium size, distinctly round in shape, yellow with a beautiful red blush. This red color is quite rare in oriental pears. The flesh is very firm, juicy, and sweet, but not high in quality. It is an extraordinary keeper, and can be found on the markets until late winter." (Reimer.)

Pyrus ussuriensis (Malaceae), 46585. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 50. Ta Suan Li.** The name means 'Big Sour Pear.' Obtained at Mao Shan, near Malanyu, Chihli, China. This is one of the most interesting and may prove one of the most valuable pears that I saw in China. It is very popular in the mountain districts northeast of Peking. The fruit is medium to large in size, slightly flattened in shape and greenish yellow in color. It has a persistent calyx, and the stem is medium to long. The flesh is hard, possesses large grit cells around the core, and has a very tart flavor. It is an excellent keeper and, under suitable conditions, often retains its standard quality until early spring. While it cannot be recommended as a desirable commercial variety, it should prove of great value in breeding blight-resistant and hardy varieties for cold regions. In our work the wild *P. ussuriensis* has shown greater resistance to pear blight than any other species, and since this species also endures more cold than any other, this variety should prove of great value in breeding work." (Reimer.)

Pyrus ussuriensis (Malaceae), 46586. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 54. E'Li** or **Nah Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. The fruit of this pear is very large, of oblong shape and greenish color. It ripens the latter part of September, is very fragrant and of poor flavor. The calyx is persistent. It is to be regretted that the flavor is not better; however,

its large size, and the fact that it belongs to *P. ussuriensis* makes it a promising variety for breeding purposes." (Reimer.)

Pyrus ussuriensis (Malaceae), 46587. **Pear.** From China. Cuttings collected by Prof. F. C. Reimer, Superintendent, Southern Oregon Experiment Station, Talent. "**No. 56. Chieh Li.** Obtained at Mao Shan, near Malanyu, Chihli, China. This pear is of medium size, oblong in shape, and green in color. The calyx is persistent. It ripens the latter part of August. The quality is only fair, but this variety should prove valuable in breeding work." (Reimer.)

Trichosanthes quinquangulata (Cucurbitaceae), 46642. From Philippine Islands. Presented by Mr. P. J. Wester, Agricultural Advisor, Zamboanga, P. I. "A cucurbitaceous vine, of vigorous growth, indigenous to the Philippines. The fruit is globose and somewhat larger than an apple, the surface being a brilliant red. As the fruit keeps well, and retains its color, I believe that it might be used to great advantage for decorative purposes." (Wester.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 152. DECEMBER, 1918.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Annona	1377	Heterospathe	1380
Artocarpus	1377	Jacaratia	1381
Berberis	1378	Lilium	1381
Carica	1378	Malus	1381
Carissa	1379	Merrillia	1382
Chenopodium	1379	Nothofagus	1382
Citrus	1379	Oxalis	1382
Cordia	1380	Pentstemon	1383
Cucurbita	1380		

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

April 12, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Annona senegalensis (Annonaceae), 46630. From Ibadan, Southern Provinces, Nigeria. Presented by the Director of Agriculture. **Abo** (wild sop) varies greatly in size sometimes being a low shrub up to 2 or 3 feet in height, and again a tree 20 feet in height. The young branches are rusty or tawny tomentose. The coriaceous leaves have a rounded apex and broadly rounded base; the upper surface is glabrescent and the lower is usually pale and more or less pubescent. The solitary flowers are borne on spreading or decurved peduncles, one-third to one and one-half inches long. The edible fruit is erect or pendent, yellow or orange when ripe and one and one-half inches or more in diameter. This plant has been found in Upper and Lower Guinea, Bornu, Mozambique District, and the upper Nile valley. (Adapted from Oliver, Flora of Tropical Africa, vol. 1, p. 16.) Introduced for breeding experiments with the different species of this genus to which the sugar-apple, sour-sop and custard-apple belong.

Artocarpus odoratissima (Moraceae), 46635. **Marang.** From Philippine Islands. Presented by Mr. P. J. Wester, Agricultural Advisor, Zamboanga, P. I. "**Marang,** also known as **madang.** A medium-sized tree with large, dark green leaves, entire or more or less conspicuously trilobate, 45 to 60 cm. (18–24 in.) long and 25 to 30 cm. (10–12 in.) broad. The tree is similar in habit to the breadfruit, and is found in the Sulu Archipelago and on the south coast of Mindanao, and was first described from Mindoro. The fruit is large, 16 cm. (6+ in.) long and 13 cm. (5+ in.) in equatorial diameter, roundish oblong, regular, thickly studded with soft, greenish yellow spines about 7 mm. (1/4 in.) long; rind thick and fleshy; flesh white, sweet, rich, juicy, aromatic, and of good flavor, separates into segments (about the size of a grape) clinging to the core; each segment containing a seed; seeds many, whitish, 8 by 15 mm. (3/10 by 3/5 in.), smooth, separating readily from the flesh. When the fruit is ripe, by passing a knife around and through the rind with a little care, the two halves separate from the flesh leaving this like a bunch of white grapes. Ripe fruits were obtained in August. The **marang** is far superior to its relatives the jak and the ordinary breadfruits found in the Philippines, and even in its present form is a remarkably good and attractive fruit. The tree was noted by the writer in Zamboanga and Davao.

"The **marang** is one of the coming tropical fruits. It is very sweet and rich in flavor, and has the unique quality of having a flesh that separates easily from the seeds and the skin. As far as I have been able to ascertain, the **marang** occurs only on the south coast of Mindanao and in the Sulu Archipelago. On my return to Manila I met on the steamer a missionary who had lived in Borneo for three years, part of which time was spent in Sandakan; she had neither heard of nor seen the fruit before. The **marang** will probably not succeed except where the climate is warm and humid throughout the year and the atmosphere close and still. In my opinion it is the best fruit of the genus. Iced, it is very delicious indeed." (Wester, The Philippine Agricultural Review, November, 1912, and letter of August 15, 1918.)

Berberis pruinosa (Berberidaceae), 46711. **Barberry.** From San Rafael, California. Seeds presented by Mr. R. H. Menzies. "This barberry is one of the handsomest of the seventy-odd species I have under cultivation. It is the first to flower, the large, clear yellow flowers being very showy. The white, powdery berries are borne profusely and are carried through the winter, a few remaining on the plant along with the next season's flowers. While an evergreen in California, it will probably be deciduous in the east. The foliage becomes very handsomely colored in the fall. I know of no barberry that puts on a greater growth, almost from the start; my plant throws out new shoots each year, all the way from 5 to 6½ feet from the base." (Menzies.)

Carica candamarcensis (Papayaceae), 46623. From Ecuador. Collected by Dr. J. N. Rose, Associate Curator, National Herbarium, Washington, D. C. "From Ambato. Called **Chamburo** in Ambato but a different species from No. 20 sent in from Huigra as **Chamburo**. Fruit small." (Rose.)

"It is very similar to the papaya. The plants grow to a height of about 10 feet, and resemble those of the papaya except in the distinctly darker color of the foliage and the less deeply lobed leaves. Staminate and pistillate flowers seem always to be produced on separate plants. The fruits are borne singly, not in clusters as is often the case in the wild papayas of Florida. They are obovoid-elliptic in shape, 2 to 4 inches in length, orange-yellow in color when ripe, with a more pronounced aroma than in the papaya. The flesh is about half an inch thick; each of the numerous seeds, which fill the large cavity, is enclosed in a

translucent, whitish aril which is the part eaten. The seeds do not adhere to the wall of the seed cavity as in the papaya, but, together with the arils surrounding them, entirely fill the cavity. The flavor of the arils is sweet and aromatic, very pleasant, and quite distinct from that of the flesh of the papaya." (Popenoe.)

Carissa carandas (Apocynaceae), 46636. From Philippine Islands. Presented by Mr. P. J. Wester, Agricultural Advisor, Zamboanga, P. I. "A thorny shrub from India, with black plumlike fruits having semitransparent, subacid flesh of very good flavor. A very good fruit eaten out of hand and would probably make a good preserve. One of the best small fruits introduced into the Philippines within recent years." (Wester.)

Chenopodium nuttalliae (Chenopodiaceae), 46632. From Mexico. Purchased through Mrs. Zelia Nuttall, Casa Alvarado, Coyoacan, Mexico. "Black-seeded form from Xochimilco, which the agriculturists there consider the best. It is of last year's crop which is particularly prized. Several Indians told me that **huauhtzontli** was considered 'more nourishing than meat.' My cook prepares it as follows: she makes bunches of the inflorescence, ties them and boils them in water and salt, then scrapes off the green seeds and shapes the mass like a small flat croquette, puts a small piece of cheese into it, dips the whole in batter made of egg and a little flour, and fries like croquettes. Sometimes she makes what looks like an omelet in the same way." (Nuttall.)

Citrus nobilis (Rutaceae), 46646. **Mandarin orange.** From Kioto, Japan. Cuttings presented by Mr. H. Atherton Lee, of the Bureau of Plant Industry. "Budsticks of the **Chu Kaa** (Vermilion orange), a variety of *Citrus nobilis*. The fruits of the **Chu Kaa** are smooth-skinned but easily peeled as with the other Mandarin varieties. The color is a light orange at the stem, becoming a deeper orange, almost red, at the blossom end; flesh delicate with little or no rag; core very small. The shape is more nearly globose than that of most Mandarin varieties. The juice is as desirable in taste as that of any citrous fruit I have tasted. The fruit is but few-seeded, for the most part having no seeds or but one. One orange was found having three seeds. This variety is resistant to citrus canker. Should it be as successful under States conditions as it is in Swatow, it would easily rival the Washington Navel, the Valencia, and the Satsuma, in popularity." (Lee.)

Cordia blancoi (Boraginaceae), 46705. **Anonang.** From Philippine Islands. Seeds presented by the Director, College of Agriculture, Los Banos, Laguna. Collected on the College Farm. A medium-sized tree, generally with a short and irregular trunk. The wood is soft and light and easily worked. It is clear yellow when first cut, changing to grayish brown. While not very durable, it is not attacked by pinhole beetles, and is useful for posts and in light construction. The bast is used for making ropes. (Adapted from Schneider, Commercial Woods of the Philippines, p. 205.)

Cucurbita ficifolia (Cucurbitaceae), 46622. **Zambo.** From Ecuador. Collected by Dr. J. N. Rose, Associate Curator, National Herbarium, Washington, D. C. "Resembles a small water-melon. Flesh white, sweetish, made into dulces and also eaten as a vegetable." (Rose.)

"I think it is not known in the United States and may prove useful there. It is a native of this country (Ecuador) where it is cultivated with corn, and is very extensively used for man as well as for stock. The plant will not endure severe frost. It grows at a temperature of from 14° to 25° C. The best rule is to grow it with corn, planting it in the corn rows 20 feet apart, each way. Although in Ecuador it is a perennial, it is more commonly treated as an annual. It is often planted along walls and at the foot of trees on which it climbs and produces fruit continually. This way is successful only where there is no frost. The way it is used here for food is as follows: when the melons are 5 or 6 inches long and the shell still soft enough for the finger nail to be driven into it, they are cooked, or made into various dishes with salt and butter. When ripe it is also eaten, cooked, with milk added at the table. For stock feed it is used when ripe, the raw fruits being cut in pieces; but it is far better, especially for hogs and milk cows, if cooked before feeding. The pulp is white and contains sugar and some starch. The ripe melons can easily be kept for a year, in a dry well-ventilated place, and are thus valuable for winter feed. The melons average 20 to 30 lbs. each. When completely ripe, the shell is very hard and the seeds black. There are two varieties, one with the shell white and the other with the shell green striped with white." (S. Ordonez M.)

Heterospathe elata (Phoenicaceae), 46640. **Palm.** From Philippine Islands. Presented by Mr. P. J. Wester, Agricultural Advisor, Zamboanga, P. I. "A tall,

unarmed palm, with a slender, straight stem and long pinnate leaves, growing in protected situations and where the rainfall is evenly distributed. It is one of the most attractive and graceful palms that I have seen and, from my experience with it at Lamao, it will make a good plant for the conservatory and possibly a good house palm." (Wester.)

Jacaratia mexicana (Papayaceae), 46696. **Bonete.** From Yucatan. Presented by Dr. Mario Calvino, Director, Estacion Experimentale Agronomica, Santiago de las Vegas, Cuba. "Seeds of **Bonete** from Yucatan. It produces edible fruits of a shape and taste much like *Carica papaya.* The **Bonete** plant lives longer than the Papaya." (Calvino.)

"A remarkable tree belonging to the same family as *Carica papaya,* but growing to a much greater size. The fruit, which is commonly called **Bonete** in tropical Mexico, is of a peculiar shape: oblong, pentagonal, five-celled, containing a milky pulp. They are somewhat sweet and edible. They are in many places prepared with sugar in the form of conserves. The leaves are compound and digitate, composed of seven distinct acute lobes." (Safford.)

Lilium columbianum (Liliaceae), 46660. **Lily.** From Bellingham, Washington. Seeds collected by Dr. David Griffiths, of the Bureau of Plant Industry. "A valuable native lily of the North Pacific Coast region, growing under very variable conditions from Northern California to far into Canada. Locally it is called Tiger lily, but is a very different thing and can be readily distinguished from that species by an entire lack of stem bulblets. The species produces abundant seed which germinate readily. This seed was collected near Bellingham, Washington, in September, 1918." (Griffiths.)

x Malus arnoldiana (Malaceae), 46698. **Apple.** From Jamaica Plain, Mass. Seed collected at the Arnold Arboretum by Dr. Walter Van Fleet, of the Bureau of Plant Industry. "Vigorous and very fruitful. May be useful as a stock for dwarfing commercial varieties of apples and for variety breeding." (Van Fleet.)

"Attention has been called to the hybrid Crabapple, *Malus cerifera.* This plant is probably one of the parents of another hybrid which sprang up spontaneously in the Arboretum many years ago and has been called *M. arnoldiana.* The other parent is probably *M. floribunda,* itself believed to be a hybrid which originated in China. If this view

of the origin of *M. arnoldiana* is correct, it is the offspring of two hybrids of different parentage, and is a good illustration of what can be obtained by crossing and recrossing the crabapples. It is a low, broad, bushy tree with long arching upper branches which are raised well above the general head of the plant and are wonderful objects when clothed from end to end with flowers and the blue sky is seen between. The flower buds, like those of *M. floribunda* are of deep rose color and the petals, after the flowers open, gradually turn from rose color to white. The flowers, however, are as large as those of *M. cerifera*, or nearly twice as large as those of *M. floribunda*, and the red fruit is intermediate in size between those of the parents." (Arnold Arboretum, Harvard University, Bulletin of Popular Information, May 16, 1918.)

Merrillia caloxylon (Rutaceae), 46647. **Katinga.** From Manila, Philippine Islands. Presented by Mr. E. D. Merrill, Botanist, Bureau of Science. A medium-sized tree with pale flaky bark, native of Siam. The compound leaves are made up of thirteen oblanceolate leaflets on a winged rachis. The pale yellowish green flowers are followed by yellow citron-like fruits four inches in diameter with a thick skin and green tasteless flesh. The tree is known as the **katinga**, and is famous in the Malay region for its beautiful wood which is of a light yellow color with dark brown streaks. It is fairly hard and takes a good polish. (Adapted from the Journal of the States Branch, Royal Asiatic Society, vol. 50, p. 113.)

Nothofagus fusca (Fagaceae), 46643. **Red Beech.** From Tapanui, New Zealand. Seeds presented by Mr. H. R. Wright, Avondale, Auckland, N. Z. A large tree often reaching a height of 100 feet and having a trunk diameter of 12 feet. The leaves, about one and one-half inches long, are oblong-ovate with serrate margins. It is sparsely distributed throughout the islands, in damp situations. (Adapted from Laing and Blackwell, Plants of New Zealand, pp. 133 and 134.)

Oxalis tuberosa (Oxalidaceae), 46659. **Oca.** From Ecuador. Collected by Dr. J. N. Rose, Associate Curator, U. S. National Herbarium. "**No. 19. Ocha.**" (Rose.)

A plant related to our common sheep sorrel, widely cultivated in Peru and Bolivia for the sake of its fleshy rootstocks, which are an important article of food.

These are eaten raw, as well as cooked, and are also frozen and dried. Raw **ocas**, when first dug, have a distinctly acid taste, like sheep sorrel, but this is lost after the tubers have been exposed to the sun. The plant attains a height of a foot or more and has the appearance of a large sheep sorrel. The flowers are yellow and the leaflets are folded at night or in wet weather, the same as in the sheep sorrel. The varieties are numerous, though much fewer than in the case of the potato. The tubers are very tender, rather crisp and juicy. In form some are nearly cylindrical, while others are slender at the base and strongly thickened at the end. The colors vary from white or light pink through darker pinks or yellows to deep purplish red. In addition to the pleasing coloration, the surface of the tubers is smooth and clear, so that the general appearance is very attractive. If the taste should prove acceptable **ocas** might become very popular for salads and pickles. The nature and habits of the plant indicate that it may be adapted to acid soil, which would be a distinct advantage in some parts of the United States. (Adapted from notes under S. P. I. No. 41168, by Mr. O. F. Cook.)

Pentstemon palmeri (Scrophulariaceae), 46595. **Beardtongue.** Plants grown at the Plant Introduction Field Station, Chico, California. "*Pentstemon palmeri*, from the western and southern slopes of the San Francisco Mountains of Arizona, is one of our best and most promising native species of this useful genus of ornamental plants. It withstands droughty conditions well and responds remarkably to good treatment. In nature the spikes stand 4 to 6 feet high and the plant is reduced to little more than a rosette of basal leaves at the close of the long dry, late summer and autumn. Under conditions at Chico, California, the flowering stems may stand 6 to 7 feet high and the plants go into winter with a vegetative growth of 18 inches or more. Its abundant glaucous green foliage, long spike (2 to 3 ft.) of large pink flowers opening progressively from below, together with its very robust habit, make it a desirable acquisition to our long list of pentstemons. It has good seed habits and if started early in flats and transplanted into the open in early spring it will blossom sparingly the same year." (Griffiths.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Laurel, Md.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 153. JANUARY, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Brosimum	1387	Ficus	1389
Carica	1387	Lysiloma	1390
Cereus	1387	Merremia	1390
Citrus	1387, 1388	Orania	1390
Corynocarpus	1388	Persea	1390
Crotalaria	1388	Rubus	1391
Cucumis	1388	Schrankia	1391
Dolichos	1389	Solanum	1391
Entelea	1389	Trichosanthes	1391
Enterolobium	1389	Triticum	1391
Euterpe	1389	Tropaeolum	1392

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

April 19, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Brosimum alicastrum (Moraceae), 46725. **Bread-nut tree.** From Cuba. Presented by Mr. Mario Calvino, Director, Agricultural Experiment Station, Santiago de las Vegas. "Seeds of the **Ramon de Mejico.** It is a fine shade tree; and it is also an economic plant, for its leaves are eaten by cattle and its seeds are eaten readily by pigs." (Calvino.)

"Dr. Lavedan of New Orleans, La., considers that the seeds, which are produced in great abundance, might be utilized as a source of industrial starch, or perhaps distilled into alcohol. I have assured him that we would be interested to test the possibilities of growing this tree, at least in southern Florida." (O. F. Cook, Bureau of Plant Industry.)

Carica sp. (Papayaceae), 46761. **Papaya.** From Colombia. Seeds presented by the Minister of Agriculture, Bogota. Said to be a wild variety of **papaya** from the tropical parts of Colombia. Judging from the seeds, this is the same species as that (S. P. I. No. 41339) secured by Mr. O. F. Cook at Ollantaytambo, Peru.

Cereus sp. (Cactaceae), 46721. **Night-blooming cereus.** From Colombia. Presented by Mr. W. O. Wolcott, Medellin. "A species of **night-blooming cereus** which has an immense, blood-red flower the size of a saucer. It opens only at night. The plant climbs on walls or any other support. "(Wolcott.)

Cereus sp. (Cactaceae), 46722. **Pitalla.** From Colombia. Presented by Mr. W. O. Wolcott, Medellin. "A cactus called **pitalla,** pronounced pee-tah-ya. The fruit grows as large as a good-sized potato and is covered with warts about one-fourth of an inch high. The inside pulp has a wonderful flavor and is very fine eating." (Wolcott.)

Citrus miaray (Rutaceae), 46732. **Miaray.** From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "With its willowy, slender, drooping branches and dense crown of dark green foliage, the **miaray** is an exceedingly handsome ornamental tree. The fruit is about the size of a lime, usually growing singly in the axils of the leaves. It is pleasantly acid and may be used like the lime. The clean, vigorous growth of the tree indicates that it is likely to prove a desirable stock for other cultivated varieties of citrus fruits." (Wester.)

Citrus webberii (Rutaceae), 46733. **Calpi.** From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "A shrubby tree with small, sharp spines. It has oblong-ovate, shining, dark green leaves and white, solitary, sweet-scented flowers. The oblate fruits, 2 inches long by 2½ inches wide, are lemon-yellow and have a thin skin, often loose like a Mandarin orange. The flesh is whitish to grayish, very juicy and aromatic, with less rag perhaps than any other citrus fruits ever examined by the writer. The trees have a long flowering season, as fruits are offered in Manila throughout the summer to late autumn." (Wester.)

Corynocarpus laevigata (Corynocarpaceae), 46764. **Karaka** From Honolulu, Hawaii. Presented by Mr. C. S. Judd, Superintendent of Forestry, Board of Commissioners of Agriculture and Forestry. "Seeds of the **karaka** tree of New Zealand. This tree was introduced into these islands in 1878 when Mr. Francis Sinclair sent the seed of it from Auckland to Mrs. Valdemar Knudsen, who planted it at Halemanu, Kauai, Hawaii, at an elevation of 3,500 feet above sea level. The tree has thriven, and forms a dense forest cover. It is considered a valuable addition to our list of water-conservation forest trees. The tree is not very long-lived but perpetuates itself by abundant reproduction. The wood is soft and the foliage is relished by stock." (Judd.)

Crotalaria sp. (Fabaceae), 46735. From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "An annual plant up to 75 cm. (2½ ft.) tall, with curious, rather attractive sepals that remain for many weeks. An interesting subject for a plant breeder of ornamentals. Native of Mindanao at an altitude of 400 to 700 m. (1,300 to 2,300 ft.)" (Wester.)

Cucumis melo (Cucurbitaceae), 46726. **Muskmelon** Grown at the Plant Introduction Field Station, Chico, California. "Seeds of an Armenian melon. It is a good bearer and the fruits weigh from 15 to 20 pounds. The skin is rough and greenish yellow in color. The flesh is white, solid and firm, and very sweet. No doubt it would make a good keeper for late use." (R. L. Beagles.)

Cucumis melo (Cucurbitaceae), 46728. **Muskmelon.** From Peking, China. Presented by Dr. Yamei Kin, who secured them from Mr. H. L. Yang, Peking University.

"Seeds of a small white melon that is very prolific and whose flesh is as fine-textured, though not so highly flavored, as the honey dew." (Kin.)

Dolichos lablab (Fabaceae), 46729. **Hyacinth bean.** From Peking, China. Presented by Dr. Yamei Kin, who secured them from Mr. H. L. Yang, Peking University. "Seeds of the Manchurian green bean which goes by the name of 'old woman's ear', probably because it is very much broader and flatter than the common string bean. It is noted for its maturing qualities, not being ready till the latter part of August and getting better with the cool autumn till the hard frost kills it. It also makes a delicious salt pickle and might be good for the salt-preserving method advocated by the Department. The bean itself is also eaten, but it is said to be better green with the pod like a string bean." (Kin.)

Entelea arborescens (Tiliaceae), 46749. **New Zealand cork.** From New Zealand. Presented by Mr. J. W. Poynton, Palmerston North. "Seeds of the **whaw** tree whose wood is but little more than half the weight of cork. Its distribution is very limited, as it is found only in isolated localities in the North Island and in one small area in the South Island. The seed vessels are very tough and are entirely surrounded by sharp needle-like spines which keep off birds and insects. The tree is very pretty, with a large, maple-like evergreen leaf and a pretty white flower. It grows to a height of 25 feet. It does not stand severe frosts, so should be sown only in the southern States." (Poynton.)

Enterolobium sp. (Mimosaceae), 46744. From Bahia, Brazil. Presented by Mr. H. M. Curran. "Seeds of a species of Enterolobium much like *E. saman*, but of dry regions. It is a handsome umbrella-shaped shade tree for Texas and California." (Curran.)

Euterpe oleracea (Phoenicaceae), 46743. **Assahy.** From Para, Brazil. From Mr. J. Simao da Costa. "Seeds of a graceful, ornamental palm. The fruits contain hardly any oil and are made into a beverage, and also into ice cream." (da Costa.)

Ficus sp. (Moraceae), 46736. From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "**Kalapat.** A small tree, used for live fence posts in

Bukidnon, Mindanao, at an altitude of 400 to 700 m. (1,300 to 2,300 ft.). The fruits which are bright red, and of about the size of small cherries are produced in great profusion in the axils of the leaves, and remain on the tree a long time,- making this a very handsome ornamental. Likely to thrive in the very mild regions of the United States." (Wester.)

Lysiloma sabicu (Mimosaceae), 46762. **Sabicu.** From Cuba. Presented by Dr. Mario Calvino, Director, Agronomic Experiment Station, Santiago de las Vegas. A Cuban tree having bipinnate leaves with small, obliquely obovate leaflets. The flowers are in small, globular heads; and the fruits are thin, flat pods. The tree is of great value for its dark-colored wood which is very heavy and extremely hard and durable,- making it valuable in shipbuilding. (Adapted from Lindley, Treasury of Botany, p. 704.)

Merremia sp. (Convolvulaceae), 46737. From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "**Burakan.** A perennial, climbing vine of vigorous growth which is bronze-colored when young. It has very large leaves, sometimes exceeding 20 cm. (6½ in.) in width, and white flowers. The vine is used for basketry, and in southern Florida would make a good ornamental. It is a native of Mindanao up to an altitude of 650 m. (2,130 ft.)." (Wester.)

Orania palindan (Phoenicaceae), 46738. **Palm.** From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "**Banga.** A tall, unarmed palm, native of the interior of Bukidnon, Mindanao, growing at altitudes ranging from 300 to sometimes exceeding 500 m. (980 to 1,640 ft.). The trunk is straight and remarkably uniform in diameter, this rarely exceeding 18 cm. (6 in.). The leaves are pinnate and silvery beneath. The trunk of the mature palm is straight-grained, easily split, and durable, and is used by the natives in making floors, fences, etc. An attractive ornamental." (Wester.)

Persea americana (Lauraceae), 46624. **Avocado.** From Ecuador. Collected by Dr. J. N. Rose, Associate Curator, National Herbarium, Washington, D. C. "Avocado from Ambato; fruit brownish to black but sometimes green or red, 2½ to 4 inches long. A fine fruit but small." (Rose.)

Rubus bogotensis (Rosaceae), 46765. **Blackberry.** From Colombia. Presented by Mr. M. T. Dawe, San Lorenzo. "I am sending you today seeds of the large-fruited blackberry called **Mora de Castilla** which grows at 3,300 m. (10,835 ft.) altitude on the Central Cordillera." (Dawe.) See S. P. I. No. 45365 for previous introduction.

Schrankia leptocarpa (Mimosaceae), 46719. From Bahia, Brazil. Presented by Mr. V. Argollo Ferrao. "Seeds of a wild sensitive plant that might be good for pasture for goats and sheep. It is a strong-growing small shrub, with the spines very much reduced, as compared with those of the common sensitive plant. The seeds are protected by a spiny fruit. The plant is not easily found as the cattle eat it back closely. It grows in good soil and is found in low ground near rivers and small streams." (Argollo Ferrao.)

Solanum sp. (Solanaceae), 46730. **Potato.** From Tucuman, Argentina. Presented by Mr. E. F. Schultz, Horticulturist, Agricultural Experiment Station. "Tubers of the **oca** wild potato. Although I do not think that this will be able to compete with the common cultivated potato, it may prove useful in some places, such as the high mountain ranges in California, as well as in some parts of the Hawaiian Islands and the Philippines." (Schultz.)

Trichosanthes sp. (Cucurbitaceae), 46739. From Philippine Islands. Seeds presented by Mr. P. J. Wester, Agricultural Advisor, Department of Mindanao and Sulu. "**No. 1.** A cucurbitaceous climbing vine with attractive foliage and roundish oblong fruits somewhat larger than a goose egg. The bright red color of the fruits is retained for several weeks and is highly decorative. Found at an altitude of about 600 m. (1,970 ft.) in the interior of Mindanao." (Wester.)

Triticum durum (Poaceae), 46766. **Wheat.** From Johannesburg, South Africa. Purchased from Mr. J. Burtt-Davy, Agricultural Supply Association. "**Golden ball.** A durum wheat; not so good a yielder as 'Oude baard,' but more drought-resistant." (Burtt-Davy.)

Triticum spp. (Poaceae), 46767 & 46768. **Wheat.** From Johannesburg, South Africa. Purchased from Mr. J. Burtt-Davy, Agricultural Supply Association. "Two varieties

of wheat from the Calvinia Division of the Cape Province. These wheats are grown under irrigation in soil which contains a good deal of both sodium carbonate and sodium chloride. They may have developed local peculiarities quite different from any possessed by American wheats." (Burtt-Davy.)

Tropaeolum tuberosum (Tropaeolaceae), 41185 & 41186. **Anyu.** From Peru. Collected by Mr. O. F. Cook on his 1915 South American trip. "One of the Andean root-crops generally cultivated in the potato-growing districts of the plateau region of Peru. Though apparently less popular than the oca and ullucu, the **anyu** has one important advantage over all the Peruvian root-crops, including the potato, in its keeping qualities. Specimens, collected in the district of Sicuani on April 9, were kept for three months at Ollantaytambo, and then brought back to Washington, and were still in good condition the middle of September. This means that the **anyu** tubers would be very easy to handle commercially in case they should prove to be of use in the United States. In Peru they are eaten like potatoes, papa lisas, and ocas, chiefly in the form of soups. The **anyu** plant is a rather close relative of another Peruvian species, *T. majus*, a familiar ornamental cultivated in the United States under the name,'Nasturtium'. Hybrids between these two species might be of interest as affording a possibility of securing ornamental varieties that could be propagated from tubers. The flowers of *T. tuberosum* are not so large as those of *T. majus* and do not open so widely but in other respects they are much the same. Experimental plantings of **anyus** should be made in the elevated districts in the southwestern states, and along the Pacific Coast. In comparison with potatoes, there appear to be very few varieties of **anyus.**" (Cook.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Bahia, Brazil.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 154. FEBRUARY, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia	1395	Livistona	1400
Actinidia	1395	Lobelia	1400
Angophora	1395	Mussaenda	1401
Annona	1396	Pachylobus	1401
Caesalpinia	1398	Passiflora	1401
Canna	1398	Rosa	1401
Carica	1399	Rhus	1402
Chamaedorea	1399	Sapranthus	1402
Colocasia	1399	Triticum	1403
Dioscorea	1400	Vitis	1403, 1404
Jatropha	1400	Voandzeia	1404

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

April 25, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia giraffae (Mimosaceae), 46805. From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Kameel-doorn.** A valuable timber tree for arid regions in the warm temperate zone. One of the few native trees in British Bechuanaland. The ripe pods are greedily eaten by stock. It thrives in sandy soil, attains a large size, and furnishes valuable shade. The wood is dark red-brown in color, and is used by the Bechuanas for spoons, knife-handles, etc. At one time this tree furnished all the fuel for Kimberly, Vryburg and Mafeking." (Burtt-Davy.)

Actinidia chinensis (Dilleniaceae), 46864. **Yang tao.** Plants grown from cuttings of S. P. I. No. 21781 sent to the Plant Introduction Field Station, Chico, California, by Mr. Wm. Hertrich, San Gabriel, California, and grafted on seedlings of S. P. I. No. 21781. The plant sent Mr. Hertrich under the former number proved to be a perfect-flowered form and one that bore fruits of good size and quality. "The **yang tao**, a deciduous climber native to Szechwan province, has attracted considerable attention because of the high quality of its fruits and the ornamental value of the plant. The leaves have a plush-like texture and an unusual dark green color, while their large size and regular spacing add to the beauty of the vine. The flowers are buff-yellow to white, fragrant, often 1½ inches across,—and are produced in great abundance. The fruits are ovoid to globose and about 2 inches long. The outside is russet-brown and is clothed with villous hairs. The flesh is green, of most excellent flavor, resembling that of a gooseberry but tempered with a flavor peculiarly its own. The fruit is good when eaten fresh and also makes very fine jam and sauce. When we consider that there are several species which are hardy in Massachusetts, that one of them, *A. arguta*, bears when mature large numbers of very sweet fruits, it would seem as though this genus should be peculiarly attractive to the plant breeder." (Fairchild.)

Angophora subvelutina (Myrtaceae), 46873. From Australia. Presented by Mr. B. Harrison, Burringbar, New South Wales. "Called here 'apple-tree'. A large, spreading tree with strong and durable timber which is used for wheelwright work and floor boards. The foliage is used to feed stock in dry seasons." (Harrison.)

Annona diversifolia (Annonaceae), 46781. **Papauce.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "Among the lesser known fruits of Mexico the **papauce** impresses me as one of the most meritorious. It seems strange that it should still be included among the lesser known species, for it is considerably superior in quality to some of its congeners whose cultivation is widespread. For example, it is a vastly better fruit than the custard-apple (*A. reticulata*), and because of its larger size and more sprightly flavor, it is preferable to the sugar-apple (*A. squamosa*),—yet both these species are much more widely grown than the **papauce.** I consider a good **papauce** almost equal to a good cherimoya. Its larger seeds are slightly against it, but the color and texture of the flesh, and the rich, subacid flavor entitle it to a place among the very best of the anonas. I first saw the **papauce** on the border between Guatemala and Honduras, in April, 1918. I did not find ripe fruit at the time, however, and had never had an opportunity to test the quality of this interesting species until I reached Tapachula. Here the fruit is abundant, and though the season is not yet at its height, **papauces** are to be seen in the market practically every day. I believe they will be abundant from now (June 24) until the middle of August. The season, unfortunately is not long. In Guatemala the common name for this species is **anona blanca** (white anona); so far, here in Mexico I have heard it called nothing but **papauce.** Safford, I believe, says it is called **ilama** in this country, but I have only heard this name applied to *A. purpurea,* which is common in the state of Vera Cruz. The **papauce** tree grows to an ultimate height of about 25 feet in this region. It is slender in habit, the trunk not more than 10 inches thick, often branching from the ground to form 3 to 6 divisions, each 2 or 3 inches thick. Some trees form an erect, slender crown; others are broad and spreading in habit. The foliage somewhat resembles that of *A. squamosa,* but is larger, with the leaf-blades commonly oblanceolate in outline, obtuse to subacute at the apex. A distinguishing character of this species is the presence of orbicular, leaf-like bracts at the base of many of the smaller branchlets. There is a great amount of variation in the productiveness of the trees. About two-fifths of those I have examined here are not carrying any fruit. If they had produced any this year at least part of the crop would still be on

the tree, as it is yet very early in the season. While three-fifths of all the trees are bearing, many of them are carrying only 3 to 10 fruits each. The best production observed was that of a tree about 18 feet high and 10 feet in spread, which was carrying 85 fruits, nearly all of them fine large specimens. It may be noted that there is less variation in size and form among the fruits of one tree than is common in the cherimoya. In this respect the **papauce** resembles the sugar-apple. In form the fruits are conical, oval, or round. The largest specimens I have seen weighed a pound and a half. The average size is between eight ounces and a pound. The surface is rough, the carpellary areas being indicated by deeply incised lines, and each area giving rise, toward its lower end, to a short point or prominence. The roughness of the surface varies considerably among the fruits from different trees, as also the color. About half the fruits examined in Tapachula were pale green in color, and half more or less magenta-pink. All of them are heavily overspread with a whitish bloom which makes them very attractive in appearance, and which has doubtless given rise to the name **anona blanca** (white anona), used in Guatemala. In the pale green varieties the flesh is white, in the pink ones it is tinged with rose-pink. It is generally considered here that the white-fleshed fruits are best, as they are sweeter. This would conform with the Mexican taste. I have met one American who told me he greatly preferred the pink ones, because they were more acid. The skin or outer covering is nearly a quarter of an inch thick, soft and coarsely granular in texture. The flesh is custard-like in consistency, and in flavor about midway between a good cherimoya and a good sugar-apple. As nearly as I can recollect, it is almost identical with the flavor of some crosses between these two species, which I sampled at Miami, Florida, several years ago. I am speaking now of the white-fleshed varieties; some of the pink ones are considerably more acid in flavor than either the cherimoya or the sugar-apple. The seeds are about as numerous as those of the cherimoya, but larger. I have usually found about 25 or 30 in each fruit. The Tapachulans do not pick the fruits until they burst open on the tree. We observed the same custom in Brazil in connection with the cultivation of the sugar-apple. I doubt if the **papauce** is sufficiently hardy for cultivation in southern California, unless it be planted in the most protected situations. It seems to be a fruit of the tropical

lowlands. In fact, it might almost be termed the 'cherimoya of the lowlands.' As is well known, the cherimoya does not succeed in the tropics unless planted at considerable elevations, where the climate is cool. This species on the contrary, belongs in the lowlands, and the fruit is exceedingly similar in character to a good cherimoya." (Wilson Popenoe, in letter dated June 24, 1918, Tapachula, Mexico.)

Caesalpinia vernalis (Caesalpiniaceae), 46949. From Hongkong, China. Presented by Mr. W. J. Tutcher. An ornamental shrub, native of Hongkong, climbing by the reversed prickles on the under side of the leaves. The bipinnate leaves are made up of 9 to 12 pairs of pinnae, each bearing 4 to 8 pairs of ovate leaflets 1 inch long. The lemon-yellow flowers are borne in racemes about 6 inches long. (Adapted from Curtis, Botanical Magazine, vol. 133, pl. 8132.)

Canna edulis (Cannaceae), 46821. **Queensland arrowroot.** From Hawaii. Tubers presented by the Agricultural Experiment Station, Honolulu. "This plant, which is exclusively cultivated in Queensland, grows to a great height, often rising to 8 or 9 feet. It has very large, broad, ribbed leaves; and as many as 15 to 20 stalks rise from a single stool, each stalk representing a large bulb. In the flowering season the plant sends up a long, straight spike from the head of which bursts a beautiful branch of bright scarlet flowers having the appearance of those of the common canna known as 'Indian Shot' but far larger. The seeds do not often mature, however, as do those of the canna family generally. The bulbs from which the arrowroot of commerce is prepared form a compact mass on and near the surface of the soil, and so prolific is the plant that I have dug from a single stool as much as 60 lb. and even 80 lb. weight of bulbs." (A. J. Boyd, Queensland Agricultural Journal, vol. 10, p. 32.)

"The rootstocks are edible and palatable when properly cooked. More culinary experimentation with them, however, will be required before any definite decision regarding their probable popularity can be made. Mr. F. G. Krauss informs us that in Hawaii, where the Experiment Station officials have been growing an acre of *C. edulis*, it has been eaten after being boiled for 30 minutes and then mashed like boiled potatoes; he declares it is a good substitute for the potato, and that it outyields the potato two to one. The tops have been used as forage for cattle and swine." (Fairchild.)

Carica candamarcensis (Papayaceae), 46782. From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "Collected at La Zacualpa, Chiapas, October 10, 1918. A wild carica common in this region. It is very similar to the papaya. The plants grow to a height of about 10 feet, and resemble those of the papaya except in the distinctly darker color of the foliage and the less deeply lobed leaves. Staminate and pistillate flowers seem always to be produced on separate plants. The fruits are borne singly, not in clusters as is often the case in the wild papayas of Florida. They are obovoid-elliptic in shape, 2 to 4 inches in length, orange-yellow in color when ripe, with a more pronounced aroma than in the papaya. The natives call them **melocotones**, or 'peaches'. The flesh is about half an inch thick; each of the numerous seeds which fill the large cavity is enclosed in a translucent, whitish aril which is the part eaten. The seeds do not adhere to the wall of the seed cavity as in the papaya but, together with the arils surrounding them, entirely fill the cavity. The flavor of the arils is sweet and aromatic, very pleasant, and quite distinct from that of the flesh of the papaya." (Popenoe.)

Chamaedorea sp. (Phoenicaceae), 46783. **Palm.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented by Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From Pochutla, Oaxaca, August 18, 1918. This closely resembles the dwarf palm which I sent in from Guatemala last year under the name **pacayito.** It is abundant on cool, shady mountain sides in the coffee district above Pochutla, at altitudes of about 3,000 feet. When mature, the plant has a slender trunk, perhaps half an inch thick and 2 feet high. The leaves are from a foot to 18 inches in length, rather finely pinnate, deep green, graceful, with the rachis stiff but arching slightly. As a house plant for the northern states, and for use in fern dishes, it seems to me that this plant possesses unusual possibilities, and I strongly recommend it for trial." (Popenoe.)

Colocasia esculenta (Aracaceae), 46788. **Dasheen.** From Port-of-Spain, Trinidad. Presented by Mr. Eugene André. "Tubers of what is being grown here as **Chinese eddoes.** This aroid gives better results in poor, dry soil than the dasheen, the latter requiring well-watered, low-lying land for remunerative crops." (André.)

"This variety, known in Trinidad as **Chinese eddo** is

very similar in appearance to what has been previously introduced into the United States as the Trinidad dasheen. The quality of the specimens received is excellent." (R. A. Young.)

Dioscorea sp. (Dioscoreaceae), 46801. **Yam.** Tubers grown at the Plant Introduction Field Station, Miami, Florida. "A very prolific, white-fleshed yam, obtained in the spring of 1918 by Dr. David Fairchild from Prof. C. T. Simpson, Lemon City, Florida. It is supposed to have come previously from the West Indies. The skin is without coloration, and the flesh remains almost snowy white when cooked. As compared with most other yams, it is very dry. It is well adapted for baking and for boiling and mashing; the mashing should be very thorough. Mashed yam becomes stiff upon cooling and therefore should be served hot. It is best to peel yams before boiling." (R. A. Young.)

Jatropha sp. (Euphorbiaceae), 46862. **Chaya de Mexico.** From Cuba. Cuttings presented by Mr. Mario Calvino, Director, Agricultural Experiment Station, Santiago de las Vegas. The leaves are edible. The following is the result of an analysis of them made at our Station during the rainy season:

Moisture	74.00 per cent
Protein	0.94 per cent
Ether extract	0.20 per cent
Carbohydrates	20.71 per cent
Crude fiber	2.25 per cent
Ash	1.90 per cent.

(Notes and analysis from letter of Dr. Calvino.)

Livistona altissima (Phoenicaceae), 46861. **Palm.** From Buitenzorg, Java. Presented by the Director, Botanic Gardens. A graceful palm with a trunk about 8 inches in diameter and often 80 feet tall, and bearing globose fruits the size of small cherries. The natives value the exceedingly hard wood very highly and use it especially for rafters which often last for three generations. (Adapted from Zollinger, Natuurkundig Tijdschrift voor Nederlandsch Indie, vol. 14, p. 150.)

Lobelia erinus microdon (Lobeliaceae), 46808. **Lobelia.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "An ornamental annual, entirely different in habit from

the ordinary garden form, being erect instead of diffuse. The fragrant flowers are beautiful shades of blue and white." (Burtt-Davy.)

Mussaenda pubescens (Rubiaceae), 46950. From Hongkong, China. Presented by Mr. W. J. Tutcher. A small, ornamental, climbing shrub, found on the island of Hongkong and in the province of Yunnan, China. The ovate-lanceolate leaves are minutely pubescent and the yellow flowers are borne in loose, few-flowered cymes. (Adapted from Sargent, Plantae Wilsonianae, vol. 3, p. 396.)

Pachylobus edulis mubafo (Balsameaceae), 46793. From Loanda, Angola, Africa. Presented by Mr. J. Gossweiler, Servicios de Agricultura. A tree found in the Cameroon valley in Upper Guinea, Africa. The odd-pinnate leaves have 15 to 17 coriaceous, ovate leaflets 4 to 6 inches long. The small flowers are borne in rusty-tomentose panicles collected near the ends of the branches. The oval, black fruits, about 3 inches long, have a pleasant taste. It is related to the Java-almond and to the pili nut. (Adapted from Oliver, Flora of Tropical Africa, vol. 1, p. 327, under *Canarium edule.*)

Passiflora sp. (Passifloraceae), 46785. **Granadita.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From Puerto Mexico, Vera Cruz; collected September 9, 1918. A passion vine which grows upon the beach in the vicinity of Puerto Mexico. Its fruits are unusually handsome and are sold in the market. They are produced upon slender stems about 4 inches long, and are round, an inch in diameter or slightly larger, and brilliant crimson-scarlet in color. Of this genus, they are by far the showiest fruits that I have seen. The outer covering of the fruit is not hard; the seeds are surrounded by white, translucent pulp of slightly acid flavor. In quality this species is inferior to *P. ligularis* in that the flavor is not so aromatic and spicy. It would be worth cultivating, however, if only for the beauty of its fruits, and it should be an excellent species to cross with some of the larger-fruited passifloras." (Popenoe.)

Rosa gentiliana (Rosaceae), 46789. **Rose.** From Kew, England. Presented by Sir David Prain, Director, Royal

Botanic Gardens. "A plant raised from a cutting supplied by Sir William Thiselton-Dyer." (Prain.)

A rose which is abundant in the mountainous regions of western Hupeh and eastern Szechuan, where it forms tangled masses 6 meters or more in height. The numerous, large, white flowers are very fragrant and the anthers are golden yellow. The species is easily distinguished by its glabrous, pale gray shoots, and the three- to five-foliate leaves which are shining green above and very pallid beneath. (Adapted from Sargent, Plantae Wilsonianae, vol. 2, p. 312.)

Rhus viminalis (Anacardiaceae) 46810. **Karree-boom.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "A hardy, evergreen tree, withstanding the drought and frost of the Upper Karroo which has an altitude of 4,600 feet, and a rainfall of about 10 inches in summer only. It grows readily from seeds, cuttings, poles or stumps set in moist ground and kept moist until growth starts. Plants have been known to make a growth of 13 feet 6 inches, in three years. It prefers a thin, limestone soil, but thrives on other soils and attains a height of about 30 feet and a spread of the same distance. It is considered an excellent timber for gate and fence posts,- poles having been found in good condition twenty-five years after they had been set in the ground. The wood is flexible and is considered excellent for yokes, keys, tobacco pipes, and furniture. Sheep and goats browse on the foliage, and the sweetish fruits are eaten by poultry and sometimes by children. The **karree-boom** makes a beautiful street and shade tree, being hardier and more ornamental than *Schinus molle*, which it resembles in habit. It should be tried in Southern California, and in Arizona and New Mexico. Sow seeds in the spring; plant cuttings or poles in mid-summer." (Burtt-Davy.)

Sapranthus sp. (Annonaceae) 46786. From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "From the mountain near Pochutla, Oaxaca; altitude 3,000 feet. Collected August 18, 1918. A peculiar annonaceous fruit which is rather common in the mountains. The tree is tall and slender, and grows in the dense forest. The fruits are the size and shape of papaws (*Asimina triloba*), that is, oblong, about 3 to 4 inches in length, and

an inch and a half in thickness. The flesh is bright orange color; I do not believe it is edible,- at any rate, it is not eaten by the natives of this region." (Popenoe.)

Triticum aestivum (Poaceae), 46815. **Wheat.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Rietti.** Bearded; ear long and open, shedding rather too easily. It stools well and is a heavy yielder, especially in wet, late seasons; wonderfully rust-resistant. The grain is dark but the flour is very white and the variety is greatly valued as a milling wheat. This is the most extensively grown wheat in the Western Province (Uganda), though 'Glujas Early' threatens to oust it from this position. It has not given very good results in the region of summer rainfall." (Burtt-Davy.)

Triticum aestivum (Poaceae), 46817. **Wheat.** From Johannesburg, South Africa. Seed presented by Mr. J. Burtt-Davy, Agricultural Supply Association. "**Glujas Early.** Beardless or semibearded; white; excellent quality; good yielder; does not shell out too easily. This is probably the most rust-resistant of all the white varieties of wheat yet introduced into the Western Province (Uganda), and stands second only to 'Rietti' in the acreage under cultivation in the principal wheat areas. It is annually gaining in popularity with every prospect of ousting 'Rietti' from the premier position. Now largely grown in the Transvaal also." (Burtt-Davy.)

Vitis sp. (Vitaceae), 46787. **Grape.** From Mexico. Seeds collected by Mr. Wilson Popenoe and presented through Dr. H. J. Webber, Director, Citrus Experiment Station, University of California. "**Totoloche.** Collected at Mogoñé, Oaxaca, October 1, 1918. A wild grape apparently belonging to the Muscadine group or closely related to it. The plant is said to be abundant in this region, but I have not seen it. The fruit is brought into town by the Indian women from San Juan Guichicovi. This impresses me as the best grape I have ever seen in the tropical lowlands, and I believe it has value. At least it should be of importance in connection with the development of a grape for cultivation in the tropics. It is vastly superior to *V. caribaea*, the berries being of much larger size and better flavor. The bunches are usually small and rather loose, but sometimes contain as many as fifty berries and

are quite compact. The individual berries are half an inch in diameter,- sometimes larger,- round, deep purple-maroon or purple in color when fully ripe. The skin is thick and tough, like that of the Scuppernong; it seems to me to be even thicker and tougher. The pulp is greenish, very juicy, containing 2 to 4 seeds, typically the latter number. While the **totoloche** appears to be most commonly eaten out of hand, it is also used in this region to make wine. When fully ripe this grape has a sweet flavor and a delicious aroma." (Popenoe.)

Vitis sp. (Vitaceae), 46833. **Grape.** From Southport, Conn. Cuttings presented by Mr. R. P. Wakeman. "During the past few years I have brought a few seedling grapes to fruitage, and out of the lot one seems good enough to be considered an acquisition. It is white in color and between 'Niagara' and 'Green Mountain' in size. The bunches are of good size but are not shouldered exactly like those of the 'Niagara'. The berries have tender pulp and are very sweet. They ripen in southwest Connecticut about September 6, and hang on well. It makes fine grape juice." (Wakeman.)

Voandzeia subterranea (Fabaceae), 46870. From Cangamba, Portuguese West Africa. Presented by Mr. A. W. Bailey. "Seeds of the ground bean which is used commonly for food both by natives and Portuguese. The local name is **vielu**. While these require a long season to mature, they may be used green as shell beans. The natives plant one in a hill. The plants do not require an excessively fertile soil." (Bailey.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Bahia, Brazil.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Societe Sultanienne D'Agriculture, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 155. MARCH, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Argania	1409	Oryza	1412
Chenopodium	1410	Oxalis	1413
Cicer	1410	Panicum	1413
Coelococcus	1410	Phalaris	1413
Colocasia	1411	Pistacia	1415
Dioscorea	1411	Prosopis	1413
Dolichos	1412	Pyrus	1414
Hymenocallis	1412	Tigridia	1414
Kraunhia	1412	Taiwania	1415

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

May 10, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Argania spinosa (Sapotaceae), 46969. From Algiers. Presented by Mr. T. H. Kearney of the U. S. Department of Agriculture. "Seeds collected from an Argania tree growing in the garden of the School of Medicine at Algiers." (Kearney.)

"A spiny, small-leaved tree from northern Africa, belonging to the Sapotaceae. It is a much-branched evergreen tree, attaining a height of from 20 to 30 feet. The fruits, the size of an olive, are used for feeding stock. After the small kernels have been roasted and ground, an oil of an irritating and harsh taste is extracted from them. This is, nevertheless, used in Morocco for food, and also for light. It makes a good soap. The tree will grow in the driest soil, and bears in four years. It is said not to be in full bearing, however, until fifteen years old." (Swingle.)

"The Argan tree is in many respects the most remarkable plant of South Morocco; and it attracts the more attention as it is the only tree that commonly attains a large size, and forms a conspicuous feature of the landscape in the low country near the coast. In structure and properties it is nearly allied to the tropical genus Sideroxylon (Ironwood); but there is enough of general resemblance to the familiar olive tree of the Mediterranean region, both in its mode of growth and its economic uses, to make it the local representative of that plant. Its home is the sub-littoral zone of southwestern Morocco, where it is common between the rivers Tensift and Sous. A few scattered trees only, are said to be found north of the Tensift; but it seems to be not infrequent in the hilly district between the Sous and the river of Oued Noun, making the total extent of its distribution about 200 miles. Extending from near the coast for a distance of 30 or 40 miles inland, it is absolutely unknown elsewhere in the world. The trunk always divides at a height of 8 or 10 feet from the ground, and sends out numerous, spreading, nearly horizontal branches. The growth is apparently very slow, and the trees that attain a girth of 12 to 15 feet are probably of great antiquity. The minor branches and young shoots are beset with stiff, thick spines, and the leaves are like those of the olive in shape, but of a fuller green, somewhat paler on the under side. Unlike the olive, the wood is of extreme hardness, and seemingly indestructible by insects, as we saw no example of a hollow trunk . The fruit, much like a large olive in appearance, but varying much in size and shape, is greedily devoured by goats, sheep,

camels, and cows, but refused by horses and mules; its hard kernel furnishes the oil which replaces that of the olive in the cookery of South Morocco and is so unpleasant to the unaccustomed palate of Europeans." (Hooker and Ball, A Tour in Morocco, p. 96.)

Chenopodium nuttalliae (Chenopodiaceae), 46956. **Huauhtli.** From Mexico. Purchased from Mrs. Zelia Nuttall, Coyoacan, Mexico City. "A form of Chenopodium (**huauhtli**) having white or rose-colored seeds. This shipment includes the entire crop grown at the little village of Los Reyes, as well as that of an Indian woman at Coyoacan. This is the finest kind of Chenopodium, and is not at all bitter. The black kind (S. P. I. No. 45722) is slightly bitter but the Indians say it is healthful, and they like it." (Nuttall.)

Cicer arietinum (Fabaceae), 47000. **Chick-pea.** From Mexico. Obtained through Mr. S. W. Augenstein, Steward, Cosmos Club, Washington, D. C., from General Alvardo Obregon, Sinaloa, Mexico. **Garbanzos** raised on the ranch of General Obregon in the state of Sinaloa, Mexico. Obtained for experimental work in this Office. "The exports of this **garbanzo** to Spain before the war were very large, and in Mexico as well as Spain it ranks as a staple food. It deserves the serious consideration of Americans." (Fairchild.)

Coelococcus amicarum (Phoenicaceae), 47007. **Ivory-nut palm.** From Hawaii. Fruits presented by Dr. Harold L. Lyon, Experiment Station of the Hawaiian Sugar Planters' Association, Honolulu. "These fruits were collected a few days ago on the premises of Mr. John Scott, of Hilo. Mr. Scott purchased fruits of this palm from a sea captain many years ago and succeeded in rearing one plant which is now a large, handsome palm, the only fruiting specimen in these islands." (Lyon.)

"A pinnate-leaved palm introduced into Guam from the Caroline Islands. The nuts are of an ivory-like texture and are exported from the Carolines to Germany for button-making. The spheroid fruit, about 7 centimeters long and 8 centimeters in diameter, has a reddish brown, glossy, scaly shell. The surface of the seed is glossy, black, and thickly striped, but not furrowed. The allied species of the Solomon Islands, *C. solomonensis*, has a straw-colored shell and the Fijian form, *C. vitiensis* (which is not used in the arts), is yellow. The inflorescence of this genus has not yet

been described. In some of the Solomon Islands the natives prepare sago from the pith of the species growing there. It is said to keep well and not to be injured by salt water, so that it is a valuable food staple to take with them on their canoe voyages." (Safford, Useful plants of Guam, p. 244.)

Colocasia esculenta (Araceae), 47002. **Dasheen.** Tubers grown at the Plant Introduction Field Station, Brooksville, Fla. "**Sacramento.** From Sacramento, California. Procured by Mr. Peter Bisset in a Chinese store under the name of 'China potato'. A dasheen similar in leaf characters to the Trinidad variety. The name **Sacramento** is given to it because the variety was obtained in that city. As compared with the Trinidad dasheen, the **Sacramento** variety has considerably fewer and larger tubers. Both corms and tubers are more regular in form, and when cooked they are generally lighter in color and are not so dry; this variety has much less flavor, however, than the Trinidad dasheen." (R. A. Young.)

Colocasia esculenta (Araceae), 47003. **Dasheen.** Tubers grown at the Plant Introduction Field Station, Brooksville, Fla. "**Ventura.** From Ventura, Cal. Presented by Mr. L. B. Hogue who obtained it several years previously from a local Chinese gardener. The name **Ventura** is given to signify the place whence the variety was obtained. A variety similar in general appearance to the Trinidad dasheen. However, the bases of the leaf stalks and the buds of the corms and tubers are distinctly more reddish in color than in the latter variety. The quality is similar to that of the Trinidad variety." (R. A. Young.)

Dioscorea alata (Dioscoreaceae), 47001. **Yam.** From Florida. Tubers of a yam growing at the Plant Introduction Field Station, Miami. Obtained April 7, 1905, from Mr. H. W. Steadman, Lemon City, Fla. Its previous history is unknown. "A white-fleshed yam of very good quality suitable for cultivation in southern Florida. The plant has been described as a rampant grower and a good yielder. A single tuber may weigh as much as 15 pounds. This yam may be baked or boiled and prepared in other ways, much like potatoes. It is best to peel before boiling. This variety is more moist than some others and, after boiling, may be mashed and beaten without milk." (R. A. Young.)

Dolichos lablab (Fabaceae), 47058. **Bonavist bean.** From the West Indies. Seeds presented by the Cotton Research Department, St. Vincent, through Mr. S. Cross Harland. "Seed of a bush form of *Dolichos lablab.* The seeds are white, and are very good to eat. Under our conditions the plants begin to bloom about five weeks after they have been sown and the whole crop is over in about ten weeks." (Harland.)

Hymenocallis sp. (Amaryllidaceae), 46974. From Ecuador. Presented by Dr. J. N. Rose, United States National Museum. "Bulbs of Hymenocallis obtained through Mr. Alfred Cartwright, at Guayaquil. Mr. Cartwright states that this plant has beautiful white flowers and long, slender, almost filiform, pendent petals." (Rose.)

Kraunhia sinensis (Fabaceae), 47008. **Wistaria.** From Texas. Cuttings presented by Mr. Charles E. Hogans, Houston. "Cuttings of a wistaria which I believe is rare in this country. It was given to me by a Japanese who had imported a few plants; he called it 'Formosa wistaria'. It blooms here in August, holds blooms for over thirty days, and the flowers are dark red. It holds its leaves all winter, if the weather is not extreme, and they are of a darker green than those of other varieties." (Hogans.)

Oryza latifolia (Poaceae), 47029. **Grass.** From Para, Brazil. Presented by Mr. André Goeldi through Mr. Geo. H. Pickerell, American Consul. "**No. 1.** A native rice, growing on soil which is not flooded in Marajo. It is interesting for several reasons. In the first place it is the tallest I ever heard of, growing sometimes to a height of 8 feet. In the second place, it is a perennial, growing in large isolated bunches for several years, flowering and bearing seeds the whole year around. Its leaves are very broad. The kernels may not have any industrial or culinary value, but as a cattle feed the green plant might be useful. Besides this, I consider it of interest from a phyto-geographical standpoint, demonstrating that real native kinds of rice are to be found in the Amazonian region." (Goeldi.)

Oryza sativa (Poaceae), 46953 & 46954. **Rice.** From Manchuria. Presented by Mr. A. A. Williamson, American Consul, Dairen. "Seeds of two varieties of dry or upland rice, received from the South Manchuria Railway

Company and which was grown at the Company's experiment station at Kung chu ling, Sinkiang. These two varieties are said to have given the best results yet obtained at that place, which lies about 400 miles north of Dairen, between 43° and 44° N. latitude, about on a line with Concord, New Hampshire." (Williamson.)

Oxalis crenata (Oxalidaceae), 47059. From France. Tubers presented by Mr. Stuart R. Cope, Paris. "I am sending you a couple of tubers of *Oxalis crenata* which has recently made its appearance here as a vegetable. It is directed to be cooked as the crosne, *Stachys sieboldi*, which is a common vegetable here and is usually fried in fat, but I am informed that this Oxalis may also be boiled and mashed, like turnips." (Cope.)

Panicum maximum (Poaceae), 47031. **Grass.** From Para, Brazil. Presented by Mr. André Goeldi through Mr. Geo. H. Pickerell, American Consul. "**No. 24. A Guinea grass** of gigantic growth, completely different from the common one we have here. The common **Guinea grass** has narrow leaves and reaches to a height of about 4 feet. This kind is stronger and much taller, having a very broad leaf, and reaching a height of 7 or more feet. It is not a native grass of this country but was introduced from Jamaica in soil which was packed around banana suckers. It was growing among the banana trees, and especially where the suckers had been laid down before planting." (Goeldi.)

Phalaris coerulescens (Poaceae), 46955. **Grass.** From Mustapha-Alger, Algiers. Presented by Dr. L. Trabut. "Seeds of a good forage grass. Our sheep know how to find the subterranean bulbous parts in the ground, and live on them, in summer, when all other vegetation is dried up." (Trabut.)

Phalaris truncata (Poaceae), 46952. **Grass.** From Mustapha-Alger, Algiers. Presented by Dr. L. Trabut. "For winter forage." (Trabut.) A perennial grass, about 2 feet high, found in the Mediterranean region. The flowers are borne in a dense spike, resembling timothy. (Adapted from Pereira, Flora de Portugal, p. 69.)

Prosopis chilensis (Mimosaceae), 46973. **Algarroba.** From Duran, near Guayaquil, Ecuador. Presented by Dr. J. N. Rose, United States National Museum. "The mesquite in

Ecuador, called **Algarroba,** is a very common shrub or tree in the dry parts of the Ecuadorean coast. The pods, which are produced in great abundance, are very sweet, and form a staple food for horses, mules, and cattle. The wood is very hard and of a dark brown color. It makes fence posts, tool handles, the very best of charcoal, and is an important fire-wood on railroad engines." (Rose.)

Pyrus kawakamii (Malaceae), 46979. **Pear.** From Formosa. Seeds presented by the Arnold Arboretum, Jamaica Plain, Mass. (Wilson **No. 10876.**) This pear is a native of the island of Taiwan and resembles *P. lindleyi*, from which it differs in having the leaves acute at both ends. The punctate, reddish fruits are globose and about one-third of an inch in diameter. (Adapted from Journal of the College of Science of the Imperial University, Tokyo, vol. 30, p. 99.)

Tigridia pavonia (Iridaceae), 46981. **Tiger flower.** From Casa Alvarado, Coyoacan, Mexico. Presented by Mrs. Zelia Nuttall, through Mr. Wilson Popenoe. "**Cacomite.** Among the plants used as food by the ancient Mexicans, the **cacomite** is one which has received comparatively little attention in modern times. This species is common on the slopes of the valley of Mexico, and is still used by the Indians to a limited extent. Doubtless it was of much greater importance as a foodstuff in ancient times than it is today. Mrs. Nuttall has planted in her garden a number of bulbs gathered on the hillsides near her home, and has found that they multiply rapidly and require no cultural attention. When in bloom, the plants are beautiful, their flowers varying from yellow to deep scarlet in color. As an ornamental plant the Tigridia is already known in other countries, but the use of its bulbs as an article of food is not common outside of Mexico. When fully developed, the bulbs are slightly less than two inches in diameter. For eating, they are usually boiled, or parboiled and fried. When boiled they are mealy and have a very agreeable flavor somewhat suggesting that of chestnuts. It is suggested by Mrs. Nuttall that the **cacomite** be given a careful trial in the southern United States as a root crop. When grown from seed it requires two seasons for the bulbs to reach maturity, but they demand very little cultural attention, and the ornamental character of the flowers should make the cultivation of the **cacomite** very attractive to those who are interested in new and rare vegetables." (Popenoe.)

Taiwania cryptomerioides (Pinaceae), 46980. From Japan. Seeds presented by the Arnold Arboretum, Jamaica Plain, Mass. An interesting evergreen tree, which may attain a height of 50 meters (164 ft.) and a diameter of 2 meters (6½ ft.), found at an elevation of 6,000 feet on the slopes of Mt. Morrison in Formosa (Taiwan). The leaves are of two kinds: those on the old wood are triangular and about one-fifth of an inch long, while those on the new growth are linear-falcate and more than half an inch in length. The subglobose cones, about half an inch long, resemble those of Cunninghamia, but the general habit of the plant is that of Cryptomeria. (Adapted from Journal of the Linnean Society, Botany, vol. 37, p. 330, and Tokyo Botanical Magazine, vol. 21, p. 21, pl. 1, 1907.)

Notes on Behavior of Previous Introductions.

A letter from Mr. Geo. E. Vinnedge, Supt. Engr. Park Dept., Fort Worth, Texas, dated April 4, 1919, states the following:

"Some six years ago we received a specimen of *Pistacia chinensis* (S. P. I. No. 24659) which is planted in the City Hall grounds, and is now 12 feet tall and measures 3½ inches in diameter at the base. It is just now, April 4, putting out its first leaves this spring. I think it will eventually prove a valuable tree in this climate."

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. [illegible]. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Georgia.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Bahia, Brazil.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. L. Lyon, Honolulu, Hawaii.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 156. APRIL, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Abies	1419	Mimusops	1422
Annona	1419	Nephelium	1422
Aristolochia	1419	Olearia	1423
Callitris	1420	Pyrus	1423
Elaeis	1420	Rhoicissus	1424
Hibiscus	1421	Salvia	1424
Indigofera	1421	Sterculia	1424
Kennedya	1422	Zea	1425

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

May 17, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Abies mariesii (Pinaceae), 47198. **Fir.** From Taiwan. Seeds presented by the Arnold Arboretum, Jamaica Plain, Mass. This differs from the type in having longer cylindrical cones and black seeds. *Abies mariesii* is a tree, 40 to 50 (occasionally 80) feet high, of compact, pyramidal form; the young shoots are very densely covered with red-brown down which persists several years. The leaves, from one-third to an inch long and one-twelfth of an inch wide, are dark shining green and deeply grooved above, glaucous beneath with two broad bands of stomata. The lower ranks spread horizontally, while the upper shorter ones point forward and completely hide the shoot. The egg-shaped cones, 3 to 4 inches long and about 2 inches wide, are purple when young. It is one of the rarest of the silver firs. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 123.)

Annona muricata (Annonaceae), 47108. **Soursop.** From Colombia. Presented by Mr. M. T. Dawe, San Lorenzo. "The **guanabana,** or **soursop,** is one of the finest sherbet fruits in existence. Its large, spiny, white-fleshed fruits are too acid to be eaten out of hand, but the juice can be sqeezed out and used to prepare a refreshing drink, a water ice, an ice cream, or the famous Habana 'champola' (a mixture of **guanabana** juice and milk, sweetened to taste). While the tree is too tender for any part of the United States except extreme south Florida, it succeeds in nearly all tropical countries, and should be more widely cultivated. When grown from seed, however, the plants are very often shy bearers and it will be necessary to select the most desirable varieties and propagate them by budding and grafting before **guanabana** culture can be commercially profitable. It is worth while to test all the different strains of this fruit which can be obtained, in order to find superior ones worthy of vegetative propagation." (Popenoe.)

Aristolochia ringens (Aristolochiaceae), 47118. **Gallito.** From Panama. Presented by Mr. G. F. Dietz, Las Sabanas. "Seeds of a vine from Jamaica called **Gallito.**" (Dietz.)

A tall, slender, twining, glabrous plant with broadly orbicular-reniform leaves dull pale green above and glaucous below. The flowers are from 7 to 10 inches long, marbled and reticulated with black-purple. It is found in Venezuela and in the West Indies. (Adapted from Curtis's Botanical Magazine, pl. 5700.)

Callitris cupressiformis (Pinaceae), 47151. From Richmond, Victoria, Australia. Seeds presented by Mr. F. H. Baker. "Grows in sand ridges where there is a small rainfall. It is a fine tree." (Baker.)

"This pine is described by Col. W. V. Legge in a report on 'The Tasmanian Cypress Pine,' (published in 1911). According to this paper, the tree is confined mainly to the coast where it does well on poor soils. It seems to have a slow growth but in time reaches a height of 100 feet and a diameter of about 2½ feet. In spite of the fact that it is chiefly a warm climate tree it also thrives in some of the colder parts of Tasmania where there is considerable frost. It has a plain whitish wood without figure and with little difference in color between the sapwood and the heartwood. Its grain is hard and close; and the wood is exceedingly durable. It is largely used for piles, telegraph poles, and in general construction work. It not infrequently grows in mixture with eucalyptus and when grown in the forest under moderate light conditions its form is that of a sharp cane which is tall in proportion to both the diameter and the spread of the lateral branches. There are all gradations from this form to the spreading, bushy tree found in the open. Since Florida is apparently the region in the United States best adapted to this species, I would advise growing some at Miami for experimental planting by the Service on the Florida National Forest. Although the tree is widely used for a great variety of purposes in Tasmania, I doubt if it would prove superior to our own conifers, and believe that the chief advantage in introducing it into Florida would probably be to furnish a comparatively soft, light wood for local use." (Zon.)

Elaeis guineensis (Phoenicaceae), 47124. **African oil palm.** From Java. Seeds presented by the Director, Botanic Gardens, Buitenzorg. The value, extent, and importance of the palm and palm-kernel oil industry of West Africa is but faintly realized by persons other than those directly interested in the trade. The amount of oil annually exported from British West Africa alone in 1915 was about 110,000 tons, and of kernels, 220,000 tons. The average price in Liverpool for kernels during the months preceding the war was about $100.00 per ton, and for palm oil $145.00 per ton. The palm tree from which the fruits are obtained is indigenous to the western coast of tropical Africa, and grows in enormous quantities from 300 to 400 miles into the interior.

The trees are 30 feet or more in height, and begin to bear in the third or fourth year. The soft, fibrous, outer covering of the fruit contains the thick, orange-red palm-oil, and the inner hard part or palm nut contains the palm kernel, a hard, white, nutty body which yields about 50 per cent of palm-kernel oil. This palm-kernel oil is used in making oleomargarine, cooking oils, and also fine toilet soaps, while the palm oil is used in the manufacture of cheaper soaps, candles, lubricating oils, etc. Although there are now on the market several machines which, it is claimed, are capable of dealing with the fruits in large quantities, they have met with very little practical success. Machinery will doubtless be invented in the next few years which will meet all demands. (Adapted from Commerce Reports, Oct. 2, 1915, Report on Palm and Palm Oil Industry, Consul Wm. J. Yerby, Dakar, Senegal.)

Hibiscus huegelii wrayae (Malvaceae), 47190. From South Australia. Seeds presented by Mr. Edwin Ashby, "Wittunga", Blackwood. "From the Gawler Ranges, South Australia. A tall shrub, bearing large, mauve-colored flowers. This is the handsomest of all the Australian 'Desert Roses.'" (Ashby.)

Hibiscus sabdariffa (Malvaceae), 47119. **Roselle.** From Florida. Presented by Mr. J. R. Fraser, Ramrod Key. "In my experiments with **roselle,** I observed one plant that seemed somewhat superior to the others, and after the first picking, I let it mature its seed. The first picking yielded 8 pounds of fruit (the usual yield is about 4 pounds of fruit per plant) and the second picking yielded 10 pounds of fruit, a total of 18 pounds per plant. The calyces on this plant were 2¼ inches in length by 1½ inches in diameter at the base." (Fraser.)

Indigofera australis (Fabaceae), 47152. From Richmond, Victoria, Australia. Seeds presented by Mr. F. H. Baker. "Native indigo plant,– a beautiful shrub, with violet flowers." (Baker.)

An erect-branching shrub, 2 to 4 feet high, with pinnately compound leaves. The nine to eleven leaflets, about three-fourths of an inch long, vary from nearly linear to almost orbicular, and the showy red flowers are borne in dense racemes. (Adapted from Bentham, Flora Australiensis, vol. 2, p. 199.)

Kennedya comptoniana (Fabaceae), 47191. From Blackwood, South Australia. Seeds presented by Mr. Edwin Ashby, "Wittunga." "This is a fine climber. The sprays of deep violet flowers are very long, and the leaves are more deeply cut than in the variety around Perth, W. Australia." (Ashby.)

Mimusops caffra (Sapotaceae), 47099. From Africa. Presented by Mr. J. Burtt-Davy, Johannesburg. A somewhat hoary or glaucous evergreen tree or shrub forming a large proportion of the sea-dune vegetation, but also extending inland on sandy soils. On the dunes it grows down to the watermark, fully exposed to sea winds and, where these winds prevail, is consequently usually dwarfed and heavily branched from the base. In shelter it gets up to about 10 meters (33 ft.) in height and 30 to 45 centimeters ($11\frac{3}{4}$ to $17\frac{3}{4}$ in.) in diameter, but even there it is heavily branched and very gnarled and crooked, and consequently yields first-rate knees, etc., for boat-building. The leaves are firmly coriaceous, and widely obovate. The flowers are usually in clusters of 2 to 4 in the axils along the branch. The fruit is 2 centimeters ($\frac{3}{4}$ in.) long, tapering to the point, red, and is relished by children. Abundant along the coast and through M'Chopes; as also in Cape Colony and Natal. (Adapted from Sim, Forest Flora Portuguese East Africa, p. 80.)

Nephelium lappaceum (Sapindaceae), 47196 & 47197. **Rambutan.** From Buitenzorg, Java. Seeds presented by the Director, Botanic Garden. "While perhaps not equaling its near relative, the litchi, the **rambutan** is one of the best fruits of the Malayan region. The late Dr. Treub of Java preferred it to the mangosteen, although it is not so esteemed by the majority of Europeans. It is a handsome fruit, and one which can bear a considerable amount of handling; hence it should be possible to market it advantageously, once it is produced in tropical America. Like the mangosteen, the durian, and the litchi, its introduction into the American tropics has not been given sufficient attention. There seems to be no reason why all of these fruits and numerous others from the Malayan region should not succeed in parts of Porto Rico, Cuba, and tropical America in general. The mangosteen, invariably considered one of the most delicate and exacting of Malayan fruit trees, has fruited successfully both in Jamaica and Dominica. The **rambutan** is seen in almost every garden about Singapore

and Penang. The tree grows to 35 or 40 feet in height, is erect, and stately in appearance, with compound leaves composed of five to seven pairs of oblong leaflets 4 inches in length. It is commonly stated that there are 8 or 10 varieties, but these appear to differ very little from one another, and are rarely propagated. The fruits are produced in pendent terminal clusters. They are the size of large plums, bright crimson in color, sometimes shaded with green or orange. The surface is covered with soft spines, half an inch long. Tearing off the thin, leathery pericarp, one finds a glistening white oval of juicy pulp, very refreshing to eat, with a pleasantly subacid flavor suggesting that of the grape." (Popenoe.)

Olearia teretifolia (Asteraceae), 47192. From Blackwood, South Australia. Seeds presented by Mr. Edwin Ashby, "Wittunga." "A bright green, almost broomlike shrub, native of Kangaroo Island, this state. It grows to 5 feet in height and is covered with masses of small, white flowers which give the bush a snowlike appearance. It stands clipping well and should make a good dwarf border hedge." (Ashby.)

Pyrus fauriei (Malaceae), 47155. **Pear.** From Japan. Seeds presented by the Arnold Arboretum, Jamaica Plain, Mass. **Wilson's No. 11256.** A thorny shrub with small leaves, 2½ to 3 centimeters (1 to 1¼ in.) long, smooth above and sparingly pubescent beneath, smooth young fruits about 4 millimeters through, and with a fugacious calyx (one lasting a very short time). This species is very striking because of its extremely small leaves, flowers and fruit. (Adapted from Schneider, Illustriertes Handbuch der Laubholzkunde, vol. 1, p. 666.)

Pyrus sp. (Malaceae), 47093. **Pear.** From Florida. Presented by Mr. Martin Campas, St. Petersburg. "Two pear trees which came as cuttings from Spain four years ago, and which I grafted on the Kieffer pear. Last year and this year they bore a heavy crop of large fruits weighing about one pound each and ripening in October and November here in south Florida. The fruit resembles the cooking pear in its hard flesh, but it is juicy and tender to eat out of hand. The tree is prolific and thrifty, with a close, dense top, and the branches are ascending. The leaves are dark green and free from disease." (Campas.)

"I was favorably impressed with this pear. It is

attractive in appearance and in texture and quality. It seemed to me to be a very great improvement over the Kieffer and every other variety that I know which is adapted to the far south. If the tree is satisfactory and is reasonably resistant to blight, it seems to me that there may be something in this variety which would be worth considering very carefully in connection with the planting of pears in the south." (H. P. Gould.)

Rhoicissus erythrodes (Vitaceae), 47100. From Africa. Presented by Mr. J. Burtt-Davy, Johannesburg. A shrubby, suberect plant, native of Abyssinia. The leathery, compound leaves are made up of 3 leaflets, the terminal one obovate, 2 to 3 inches long, the lateral ones broadly ovate; all are smooth and deep green above, but covered with fine gray pubescence below. The scarlet flowers occur in small, lateral cymes, and the globose fruits are about half an inch in diameter. (Adapted from Oliver, Flora of Tropical Africa, vol. 1, p. 401.)

Salvia hispanica (Menthaceae), 47126. **Chia.** From Mexico. Seeds procured by Mr. Cornelius Ferris, Jr., American Consul, San Luis Potosi. "This seed was obtained in the semitropical region of the state of San Luis Potosi and is known simply as **chia**. It is the kind used in making the drink called 'chia'. (Ferris.)

"**Chia** is widely used in Mexico for the preparation of a 'refresco', or as an addition to 'refrescos' prepared with limes or other fruits. I have never observed the plant in cultivation. The seed, which is often seen on sale in the markets, is similar in appearance to mustard seed, except in its grayish color. When soaked in water it behaves somewhat as tapioca, each seed becoming surrounded by a transparent gelatinous substance almost without taste. A glass of sweetened water to which has been added a few **chia** seeds is considered a good drink; it lacks character, however, and may be considered much better when lime juice is one of the ingredients. This drink is a peculiar thing, difficult of description, but not unworthy of introduction into other countries. It may be mentioned that the state of Chiapas takes its name from 'chia', meaning 'place where the **chia** abounds'." (Popenoe.)

Sterculia diversifolia (Sterculiaceae), 47153. **Kurrajong.** From Richmond, Victoria, Australia. Seeds presented by Mr. F. H. Baker. Found in Victoria, New South Wales, and Queensland. Useful as human food, as a forage

crop and as a fiber plant. The tap roots of young trees and the young roots of old trees are used as food by the aborigines. When boiled, the roots have a flavor similar to that of turnips, but sweeter. The seeds of this and other species are edible and make a good beverage. Cattle and sheep are fond of the leaves and branches, and in some dry seasons have existed for long periods on scarcely anything else. In parts of Riverina (New South Wales) the trees are cut down as required for this purpose. A strong fiber is obtained from the bark; it is used by the aborigines for making fishing nets, both in East and West Australia. (Adapted from Maiden, Useful Native Plants of Australia, pp. 59, 140, and 633.)

Zea mays (Poaceae), 47109 to 47114. **Corn.** From Brazil. Presented by Mr. H. A. Cardinell, Rio de Janeiro. "A rather curious collection of corn grown by the various Indian tribes from the states of Matto Grosso and Amazonas. This corn came from an exhibit prepared by a commission from that district for the last national corn show held in Rio de Janeiro last August (1918). The commission informed me that this corn is absolutely wild in Matto Grosso and the Indians have made no attempt at its improvement. The ears I am sending were grown by the Amazon Indians over 1,500 kilometers (930 miles) from the Madeira River which is a branch of the River Amazon and forms half of the boundary between the two above-named states; that is, it was brought 930 miles before it reached that river. This will give you an idea of the distance this corn traveled before reaching Rio." (Cardinell.)

Zea mays (Poaceae), 47202. **Corn.** From Zamboanga, Philippine Islands. Presented by Mr. P. J. Wester, Agricultural Advisor. "A corn variety discovered on a recent visit to Kudurangan, Cotabato, Mindanao, that matures 72 days from sowing and so may be of value to your corn breeders. This corn has been grown for many years (no one knows how many) by one of the wild tribes in Cotabato." (Wester.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Ga.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Bahia, Brazil.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. L. Lyon, Honolulu, Hawaii.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 157. MAY, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Amorphophallus	1429	Phoenix	1433
Annona	1429	Prunus	1433–1436
Barosma	1429	Pyrus	1436
Berberis	1429, 1430	Rubus	1437
Cordeauxia	1430	Solanum	1437
Dialium	1431	Spathodea	1437
Erythrina	1432	Strophanthus	1438
Kokia	1432	Synsepalum	1438
Pahudia	1432	Vitex	1439

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,

Agricultural Explorer in Charge.

May 31, 1919.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Amorphophallus konjac (Araceae), 47226. **Konyaku.** From Japan. Tubers collected by Mr. Walter T. Swingle, Bureau of Plant Industry. "Starch from these tubers is used for food in Japan. During the war the starch prepared from this plant was exported to the United States,- it is said to be used in treating aeroplane wings. In Japan, **konyaku** is grown under the shade of orange trees, and as it seems to be important both for food and for industrial starch, I am anxious to see what it will do in this country." (Swingle.)

Annona senegalensis (Annonaceae), 47214. **Abo.** From Southern Provinces, Nigeria. Seeds presented by Mr. A. H. Kirby, Asst. Director of Agriculture, Ibadan. "No European production in any way resembles the *Annona senegalensis,* with its large, blue-green leaf and its small fruit. The fruit contains an aromatic, dark red pulp, and in a modest degree displays something of that captivating quality which has exalted its kindred plant, the cherimoya of Peru, to its high repute as the queen of fruits. It must be owned, however, that it is difficult to secure a well-developed example of this fruit, for so keenly is it spied out and devoured by the birds that often for months together it may be sought in vain." (Dr. George Schweinfurth, The Heart of Africa, p. 222.) See S. P. I. No. 46630 for previous introduction.

Barosma crenulata (Rutaceae), 47221 & 47222. **Buchu.** From Cape Town, Union of South Africa. Seeds presented by the Conservator of Forests. A small evergreen shrub, with opposite or alternate, simple, dotted, leathery leaves, in the axils of which the flowers appear. The **buchu** leaves of commerce are procured chiefly from *B. crenulata, B. crenata,* and *B. serratifolia.* The leaves are much used in medicine as a stimulant and tonic, and appear to have a specific effect in chronic diseases of the bladder, their action probably being dependent on the powerfully smelling, volatile oil which they contain. (Adapted from Lindley, Treasury of Botany, p. 125.)

Berberis polyantha (Berberidaceae), 47299. **Barberry.** From Wisley, Surrey, England. Plants presented by Mr. Fred J. Chittenden, Director of the Royal Horticultural Society's Gardens. A deciduous shrub, 6 to 10 feet high, with simple or three-pronged thorns, obovate leaves, mostly rounded at the apex, and yellow flowers

which are produced during June and July in drooping panicles carrying from 20 to over 50 blossoms. The fruit is red. This is a very fine species, remarkable for the large and abundant flower panicles. (Adapted from Bean, Trees and Shrubs Hardy in the British Isles, vol. 1, p. 246.)

Berberis rubrostilla (Berberidaceae), 47300. **Barberry.** From Wisley, Surrey, England. Plants presented by Mr. Fred J. Chittenden, Director of the Royal Horticultural Society's Gardens. "An elegant and beautiful seedling barberry of unrecorded parentage, but probably a hybrid between *B. wilsonae* and *B. concinna.* It has the growth of the latter, but has large pendent fruits of a rich coral-red color. A very pretty and useful addition to our fruiting shrubs." (Gardeners' Magazine, vol. 59, p. 449.)

Cordeauxia edulis (Caesalpiniaceae), 47213. **Yeheb nut.** From Aden, Arabia. Seeds presented by Mr. A. C. Watson, American vice consul. "The **yeheb nut** is produced by an evergreen shrub 4 to 6 feet high. It forms a staple food of the people of Somaliland (East Africa) and during certain seasons the Arabs are said to stew it and eat it in preference to dates or rice. Being evergreen and coming from a frostless region, it will probably prove to be tender. Its compound leaves are covered on the under side with glandular hairs which stain one's fingers a magenta color. In composition the **yeheb nut** resembles the chestnut quite closely and as a food it may be comparable to it in value. Being a desert species and yet able to stand humid weather, it may prove of unusual interest if it can be grown extensively on the dry lands of Florida, for example. It is said to form a tap root very quickly and thus establish itself; but how long it takes to come into bearing is not known." (Fairchild.)

"The small flowers are borne in terminal corymbs and are followed by the coriaceous, one-seeded pods. The ovoid seeds, which are from 1 to 2 inches long, are greatly valued by the natives for food. In preparing the nuts for use, it is desirable that they should be soaked in just such a quantity of water as they can absorb, since if more be used there is danger of loss of the sugars, which would diffuse into the excess of water. The following analysis of the kernels gives a good idea of the food value of these nuts:

	Per cent
Moisture	9.3
Ash	3.1
Sugars (Reducing)	2.3
Sugars (Cane)	21.6
Carbohydrates (other than sugars), by difference	37.1
Proteids (Albuminoids)	11.8
Proteids (Amides)	1.3
Fibre	2.7
Oil	10.8
Nutrient ratio	6.5
Nutrient value	92.0

"The nuts were tested for alkaloids and glucosides, but no indication of the presence of such constituents was obtained. The results of the analysis indicate that the nuts are likely to prove a useful food. A satisfactory point is the presence of considerable quantities of sugars and oil. Judging from the analytical figures alone, the nutrient ratio, i.e., the ratio of albuminoids to carbohydrates and oil converted into their starch equivalents, is a very serviceable one, and the total nutrient value high. The kernels are rather tough, and this point raises some doubt as to the complete digestibility of the carbohydrates other than sugars." (Kew Bulletin of Miscellaneous Information, 1908, pp. 36, 43.) See S. P. I. No. 43260 for previous introduction.

Dialium divaricatum (Caesalpiniaceae), 47315. **Otu.** From Bolivar, Colombia. Fruits collected by Mr. H. M. Curran at Tierras de Loba. "The wood is used for general construction requiring strength. The bark is used for medicinal purposes. Native to the northern states of Brazil." (Correa, Flora de Brazil, p. 41.)

A tree with alternate, pinnately trifoliolate leaves, the leaflets being ovate and about 2 inches long. The flowers are borne in erect terminal panicles and are followed by smooth, brown, pear-shaped fruits the size of a hazel nut. The seeds are surrounded by a pleasantly acid pulp much resembling that of the tamarind to which this tree is closely related. (Adapted from Vahl, Enumeratio Plantarum, vol.1, p. 303.)

Erythrina variegata (Fabaceae), 47207. **Dapdap.** From Los Banos, Philippine Islands. Seeds collected by Mr. Nemesio Catalan and presented by Dr. E. B. Copeland, of College Farm. "A tree with brilliant red flowers which form a very showy inflorescence. Collected from tree on College Farm." (Catalan.)

"If hardy in south Florida it may prove larger and more showy than the other species of Erythrina grown there." (Fairchild.)

Kokia drynarioides (Malvaceae), 47223. From Pukoo, Mapulehu, Molokai, Hawaiian Islands. Seeds presented by Mr. J. F. Rock, Honolulu. "A tree 4 to 8 meters high, woody throughout, with large lobed leaves and bright red flowers of silky texture, occurring singly in the axils of the uppermost leaves. The thick, woody capsule, about an inch in length, contains several obovoid seeds which are thickly covered with short, reddish brown hairs. Of this exceedingly interesting species there has been only one tree in existence up to a few months ago. This same tree, which was declared dead, still showed some signs of life and produced a few capsules with mature seeds; but this is evidently the last, only a small branchlet having produced a few leaves." (J. F. Rock, The Indigenous Trees of the Hawaiian Islands, p. 307, 1913.)

"An almost extinct species of tree of the mallow family, which, because of its relationship with the cotton plant and its possible value for hybridization purposes, has been thought important to rescue from extinction. Seeds of this species received from Mr. Rock have been propagated by this Office and the plants grown from them have been distributed to all such Botanic Gardens in various parts of the world as are situated in regions where the species has a chance of succeeding. Reports received indicate that a number of these are growing. A tree at Miami, Florida, is now four feet high." (Fairchild.)

Pahudia rhomboidea (Caesalpiniaceae), 47210. From Los Banos, Philippine Islands. Seeds collected by Mr. Nemesio Catalan and presented by Dr. E. B. Copeland, of College Farm. "**Tindalo.** A tree that usually occurs in somewhat open situations of low elevation. The wood is very durable and beautifully colored; it is used for finer constructions, and is one of the best Philippine woods. Collected from Mount Maquiling." (Catalan.)

Phoenix dactylifera (Phoenicaceae), 47229. **Date palm.** From Tripoli. Seeds presented by Dr. O. Fenzi, Director, Stabilimento Orticolo Libico, Tripoli, Tripoli. "**Tabuni.** Season, late August to mid-December. The commonest kind in the Oasis of Tripoli; fruit small to medium in size, olive shaped, with very thin skin, pulp fiberless and more sugary than 'Bayudi.'" (Fenzi.)

Phoenix dactylifera (Phoenicaceae), 47302. **Date palm.** From Tripoli. Seeds presented by Dr. O. Fenzi, Director, Stabilimento Ortico Libico, Tripoli, Tripoli. "**Bayudi.** Ripening as early as August. Fruit large, cylindrical; pulp rather sweet, but somewhat fibrous." (Fenzi.)

Phoenix dactylifera (Phoenicaceae), 47303. **Date palm.** From Tripoli. Seeds presented by Dr. O. Fenzi, Director, Stabilimento Orticolo Libico, Tripoli, Tripoli. "**Bronsi.** One of the latest varieties, rarely ripening before October. Fruits large to very large, bright crimson in color, turning to shining black at maturity; pulp of extra good quality." (Fenzi.)

Prunus serrulata (Amygdalaceae), 47132-45. **Flowering cherry.** From Japan. Cuttings purchased from the Yokohama Nursery Company, Yokohama.

"**Ariyake.** (47132). Branches brown-gray, young leaves yellow-brown, inflorescence in two- to four-flowered long-pedunculate false umbels, blossoms white or delicate pink. Single and slightly double blossoms appear on the same tree. Blossoms in mid-April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 98, under *P. serrulata* f. *candida*.) "Flowers pale pink, single or semi-double, very large and fragrant. This is a very striking form." (Wilson, The Cherries of Japan, p. 51, under *P. lannesiana*, f. *ariake*.)

"**Choshu-hizakura.** (47133). A medium-sized tree with spreading top, brown-gray twigs, young leaves deep red, inflorescence in two- to four-flowered pedunculate umbels or corymbs, flowers 4 centimeters (1½ in.) in diameter and uniformly rose-color. The red young leaves and rose-colored flowers make this cherry very attractive. Blossoming time, mid-April. (Adapted from Miyoshi, Japanische Bergkirschen p. 121, under *P. serrulata* f. *splendens*.) "Flowers pink, single or semi-double. This form is of little horticultural interest." (Wilson, The Cherries of Japan, p. 51. & Suppl. *ii*. under *P. serrulata* var. *sachalinensis*, f. *chosiuhizakura*.)

Fugenzo. (47134). A medium-sized tree with long, pendent inflorescences, two green leaflets in the flower-bud, and striking full-blown flowers, red at first, soon becoming white. The flower buds open one after another thus prolonging the blossoming time usually to the first of May. I have seen the last flower as late as the first of June. (Adapted from Miyoshi, Japanische Bergkirschen, p. 123, under *P. serrulata*, f. *classica*.) "One of the most beautiful of all cherries and now well known in gardens under the name of **James H. Veitch.** The flowers are rose-pink and the variety is distinguished by the presence of two leafy carpels in the center of each flower. Its Japanese name is **Kofugen** or **Benifugen**, and this and its white form(*albo-rosea*)are the only kinds of Japanese cherries which have green and leafy carpels." (Wilson, The Cherries of Japan, p. 39, under *P. serrulata*, var. *sachalinensis*, f. *fugenzo*.)

Horinji. (47135). A small tree with dark gray twigs, yellowish brown young leaves and flowers with roundish petals, the outer rank pink, the inner rank white. Blossoming time from the middle to the end of April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 110, under *P. serrulata*, f. *decora*.) "This is a very beautiful form, with clusters of pale pink, double or semidouble flowers." (Wilson, The Cherries of Japan, p. 40, under *P. serrulata*, var. *sachalinensis*, f. *horinji*.)

Kan-zakura. (47136). "Flowers single, pale pink and rather small. A curious cherry which blooms in late winter, hence its Japanese name **Kan-zakura**, i.e. 'Winter Cherry.'" (Wilson, The Cherries of Japan, p. 31, under *P. serrulata*, var. *spontanea*, f. *praecox*.)

Kokonoye. (47137). A small tree with erect, slender branches, light gray twigs, brownish green young leaves, inflorescence in two- to four-flowered pedunculate umbels or false umbels with uniformly pink flowers. Blossoms in mid-April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 107, under *P. serrulata*, f. *homogena*.) "Flowers pink, double or semidouble, on long pedicels, the peduncle is usually short." (Wilson, The Cherries of Japan, p. 40, under *P. serrulata*, var. *sachalinensis*, f. *homogena*.)

Kongosan. (47138). "Flowers pink, single. This form is of little horticultural interest." (Wilson, The Cherries of Japan, p. 52, under *P. lannesiana*, f. *kongosan*.)

Oshima-zakura. (47139). A large tree with young leaves delicate brown turning to green, green peduncles, green calyces, and large, white, fragrant flowers in four- to five-flowered corymbs. (Adapted from Miyoshi, Japanische Bergkirschen, p. 42. under *P. mutabilis*, f. *speciosa* .)

"As it came under my observation in Japan, this cherry is quick-growing and obviously short-lived. It makes a tree from 6 to 10 meters (19¾ to 32¾ ft.) tall with a trunk from 1 to 2 meters (3¼ to 6½ ft.) in girth, and has thick, spreading and ascending-spreading branches. The bark is pale gray and smooth even on quite old trees. The shoots are stout, usually with prominent lenticels, grayish at first and often passing to dull reddish purple before becoming finally pale gray. The leaves are glabrous and green, but as they open often have a more or less brownish, metallic lustre; they are ovate or rarely obovate, abruptly caudate-acuminate, double-serrate, and the teeth are long-artistate. The flowers are fragrant, everywhere glabrous, white (pinkish in the bud) and may appear before or with the leaves; the peduncle is sometimes almost wanting; usually it is from 2 to 4 centimeters (¾ to 1½ in.) long, but occasionally it is 6 centimeters (2⅜ in.) and even more in length. The scaly involucral bracts are slightly viscid, the bracts subtending the pedicels are green, obovate, glandular-ciliate and very prominent. The fruit is ovoid, black, and lustrous. In this cherry the peduncle is extremely variable in length, often on the same individual tree, but this character has no taxonomic value in this or any other Japanese species. Varieties and forms have been based on this character, which is not only inconstant, but may vary from year to year. Koidzumi has distinguished the wild plant under the name of *speciosa*, but I can not discover any differences between a series of specimens from wild trees and another from cultivated trees. Koehne says this plant is under cultivation in Europe under the name of *P. serrulata yoshino*. In Japan the vernacular name **Yoshino** is applied to *P. yedoensis*, and not to any form of *P. lannesiana*. Koidzumi gives the vernacular name of **Oh-yama-sakura** to the wild plant. The cultivated plant and its forms are known as **Oshima-zakura** or as **Sakura.**" (Wilson, The Cherries of Japan, p. 45, under *P. lannesiana*, f. *albida.*)

Ranzan. (47140). "Flowers single, pink, on long, slender pedicels. This is a very pleasing form." (Wilson, The Cherries of Japan, p. 52, under *P. lannesiana*, f. *ranzan.*)

Shirayuki. (47141). A moderately large tree with numerous, closely crowded, erect-spreading branches, smooth, brown-gray twigs, yellowish brown young leaves and white flowers with hairy peduncles. Blossoming time mid-April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 127, under *P. serrulata*, f. *nivea.*) "With its large flowers this distinct form resembles *P. yedoensis*,

but the bracteoles show that it belongs to *P. serrulata.* The branches are erect-spreading and the flowers white, single, or nearly so." (Wilson, The Cherries of Japan, p. 34, under *P. serrulata*, var. *pubescens*, f. *sirayuki.*)

Surugadai-nioi. (47143). A moderately large tree with brown-gray twigs, brownish red young leaves and white, fragrant flowers. Blossoming time about the end of April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 132, under *P. serrulata*, f. *surugadai-odora.*) "Flowers semidouble, fragrant, nearly white, pendulous on long, slender pedicels. This is a late-flowering form." (Wilson, The Cherries of Japan, p. 51, under *P. lannesiana*, f. *surugadai-odora.*)

Taki-nioi. (47144). A medium-sized tree with spreading branches, brown-gray twigs, brown-red young leaves, flower buds with reddish tips and white, fragrant flowers. Blossoming time about the end of April. (Adapted from Miyoshi, Japanische Bergkirschen, p. 133, under *P. serrulata*, f. *cataracta.*) "Flowers single, white, and very fragrant. The vernacular name (**taki-nioi**) signifies 'fragrance from a cataract.'" (Wilson, The Cherries of Japan, p. 48, under *P. lannesiana*, f. *cataracta.*)

Ukon-zakura. (47145). "A medium-sized tree with light yellow-green flowers, the outermost petals of which are pinkish on the outer surface. Blossoming time the last of April. A subform *lutioides*, of lighter yellow-green color (**Asagi.**) is found in Kohoku. (Adapted from Miyoshi, Japanische Bergkirschen, p. 124, under *P. serrulata*, f. *luteo-virens.*) "Flowers greenish yellow, semidouble or double. This is a very striking cherry with large flowers, borne in great profusion. The Japanese names are **Ukon** and **Asagi.**" (Wilson, The Cherries of Japan, p. 56, under *P. lannesiana*, f. *grandiflora.*)

Pyrus communis (Malaceae), 47227. **Pear.** From Mustapha-Alger, Algiers. Cuttings from Dr. L. Trabut. "**Kontoula** pear from Achaia. Grafts of an early pear, which bears abundantly a very sweet little pear which is quite fragrant. This vigorous tree, which rapidly attains large dimensions, appears interesting to me. In 1914, the Botanical Station received from Greece some grafts of a pear whose fruits are much esteemed because of their earliness; in Elis and Achaia, where it is much cultivated, it bears the name of **Kontopodaroussa** or **Kontoula**; there it attains large dimensions and is remarkable for its great and regular fruitfulness. Grafted upon *Pyrus gharbiana*, a species native to Algeria

and Morocco, it made good growth in 1915. In June, 1918, the erect branches were covered with fruits. This pear is of small size, with a short peduncle, beautiful yellow, fine, sugary, fragrant flesh, not softening. It ripens in June, and is much superior to other early pears, ripening on the same date." (Trabut.)

Rubus strigosus x rubrisetus (Rosaceae), 47296. **Raspberry-dewberry.** From College Station, Texas. Plants presented by Mr. H. Ness, Horticulturist, Texas Agricultural Experiment Station. **No. 1.** A hybrid between *Rubus strigosus* (the Brilliant), a red raspberry, as the staminate parent, and *Rubus rubrisetus,* a dewberry, as the pistillate parent. The fruit is dark red to nearly black and the flavcr is mildly acid, with a strong reminder of the raspberry,- very superior to the blackberry. The drupelets adhere more to the core than in the raspberry. (Adapted from the Journal of Heredity, frontispiece, vol. 9, p. 338, 1918.)

Solanum scalare (Solanaceae), 47310. From Giza Mouderieh, Egypt. Seeds presented by Mr. F. S. Walsingham, Ministry of Agriculture, Horticultural Division. A shrubby solanum found along streams on the west coast of Africa from Sierra Leone to Pungo Andongo. The stem, the leaves, and the outside of the flowers are covered with stellate pubescence. The ovate-oblong leaves have undulate margins and the white or violet flowers, half an inch across, are borne in racemose clusters of about ten. The fruits are smooth, shining red, globose berries, about half an inch in diameter. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 4, sec. 2, p. 224.)

Spathodea campanulata (Bignoniaceae), 47216. **Oruru.** From Southern Provinces, Nigeria. Seeds presented by Mr. J. H. Kirby, Asst. Director of Agriculture, Ibadan. A strikingly handsome tree, 20 to 70 feet or more high, with a smooth, white stem without branches for a considerable height from the ground, and a luxuriant, conical head of foliage, all studded with large flowers of a bright orange-scarlet. One of the most beautiful trees in Angola, flowering from September to the end of May, and fruiting in June and July. Suitable for avenues or as a shade tree. Raised from seed which is winged, light, and freely distributed by the wind. (Adapted from Kew Bulletin, Useful Plants of Nigeria, Part 3, p. 509.) "A tender, rapidly growing species

killed back, in south Florida, by a temperature of +26° F. but quickly sprouting from the ground." (Fairchild.)

Strophanthus gratus (Apocynaceae), 47217. From Southern Provinces, Nigeria. Seeds presented by Mr. A. H. Kirby, Asst. Director of Agriculture, Ibadan. A handsome flowering plant; it may be propagated by seeds which are distinguished from the Strophanthus seeds of commerce (*S. kombe*) by being glabrous. The seeds of this species are recommended for use in medicine, in preference to those of any other, chiefly because they yield crystalline strophanthin, whereas the established official Strophanthus yields this glucoside in an amorphous condition. Used for poisoning arrows. (Adapted from Kew Bulletin, Useful Plants of Nigeria, Part 3, p. 447.)

Strophanthus hispidus (Apocynaceae), 47218. From Southern Provinces, Nigeria. Seeds presented by Mr. A. H. Kirby, Asst. Director of Agriculture, Ibadan. "The seeds are an important drug, worth about 2s. to 2s. 6d. (approximately 50 to 60 cents) per pound wholesale, commonly shipped in the pods, but more often taken out, freed from the awns and packed in bales. The seeds are poisonous, the active principle being strophanthin; used in Nigeria and generally in tropical Africa for arrow poison. It may be propagated by seed, but the commercial supply is obtained, so far, from wild plants,- strong fibers making the seed difficult to collect, though, according to Dalziel, as a shrub with long lax branches it is capable of being grown in the neighborhood of towns and villages. The seed pods are available in October at Abepa, Kabba Province, where the plant is said to be plentiful. The seeds take several months to ripen. Billington reports collecting in October a pod then not quite ripe, after noting its development for ten months." (Kew Bulletin, Useful Plants of Nigeria, Part 3, p. 448.)

Synsepalum dulcificum (Sapotaceae), 47219. **Agbayun.** From Southern Provinces, Nigeria. Seeds presented by Mr. A. H. Kirby, Asst. Director of Agriculture, Ibadan. "This tropical African tree flowers in the months of June, July, and August, and usually produces a number of oblong or oval berries which resemble olives; they are dull green at first but gradually change, as they ripen, into a dusky red. The seeds are enclosed in a thin, soft, slightly saccharine pulp which, when

eaten, has the peculiar property of making the most sour and acidulous substances seem intensely sweet, so that citric or tartaric acids, lime juice, vinegar, and all sour immature fruits eaten thereafter taste as if they were composed wholly of saccharine matter. The duration of this effect depends upon the amount of berries eaten, and the degree of maturity they have attained; when a sufficient quantity has been taken, their influence is commonly perceptible throughout the day. This peculiar principle, however, is soon dissipated if the fruits are allowed to remain in a ripe condition for any length of time; preserved fruits brought to England not only lost this property, but became extremely insipid. The natives of the Gold Coast often use them to render their stale and acidulated kankies (maize bread) more palatable, and to give sweetness to sour palm wine and pitto (beer made from maize.) (Adapted from Pharmaceutical Journal, vol. 11, p. 446.)

Vitex grandifolia (Verbenaceae), 47220. **Oricta.** From Southern Provinces, Nigeria. Seeds presented by Mr. A. H. Kirby, Asst. Director of Agriculture, Ibadan. Near the River Nun, *Vitex grandifolia* is a small tree with the habit of an Aralia, growing to a height of 25 feet. In Akwapim it is a shrub, 10 feet in height, with cream-colored flowers, found at an elevation of 1,000 feet. The fruit is edible, about the size of a small plum; it is made into a kind of honey. The wood is used for making large drums. (Adapted from Kew Bulletin, Useful Plants of Nigeria, Part 3, p. 526.)

United States Department of Agriculture.
Bureau of Plant Industry.
Office of Foreign Seed and Plant Introduction.
Washington, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Plant Introduction Field Stations.
B. T. Galloway, Plant Pathologist.
Peter Bisset, Plant Introducer, in Charge of Foreign Plant Distribution.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
H. C. Skeels, G. P. Van Eseltine, and R. A. Young, Botanical Assistants.
H. E. Allanson, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Plant Introduction Field Station, Chico, Cal.
E. O. Orpet, Assistant in Plant Introduction.
J. E. Morrow, Superintendent in Charge, (Yarrow) Plant Introduction Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Plant Introduction Field Station, Miami, Fla.
D. A. Bisset, Assistant in Charge, Plant Introduction Field Station, Brooksville, Fla.
Henry E. Juenemann, Superintendent in Charge, Plant Introduction Field Station, Bellingham, Wash.
E. J. Rankin, Assistant in Charge, Plant Introduction Field Station, Savannah, Ga.

Collaborators.

Mr. Aaron Aaronsohn, Haifa, Palestine.
Mr. Thomas W. Brown, Cairo, Egypt.
Mr. H. M. Curran, Bahia, Brazil.
Mr. M. J. Dorsey, University Farm, St. Paul, Minn.
Mr. Robt. H. Forbes, Cairo, Egypt.
Mr. A. C. Hartless, Saharanpur, India.
Mr. Barbour Lathrop, Chicago, Ill.
Mr. H. L. Lyon, Honolulu, Hawaii.
Mr. H. Nehrling, Gotha, Fla.
Mr. Charles Simpson, Littleriver, Fla.
Mr. H. P. Stuckey, Experiment, Ga.
Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria.
Mr. H. N. Whitford, School of Forestry, New Haven, Conn.
Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.
Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 158. JUNE, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Abroma	1443	Gossypium	1445
Achradelpha	1443	Gynura	1445
Annona	1443	Hibiscus	1445
Brassica	1448	Ipomoea	1446
Butia	1443	Lithocarpus	1446
Caesalpinia	1444	Mammea	1446
Cucurbita	1444	Pistacia	1447
Dioscorea	1444	Phyllostachys	1447
Echium	1444	Rosa	1448
Garcinia	1445	Xanthosoma	1448
Glycine	1445		

Plates:

Pl. 239. The Nanking cabbage, a winter variety of Pai ts'ai, *Brassica pekinensis.*

240. The Manzanilla, a Central American fruit tree, *Crataegus stipulosa.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued June 28, 1919, Washington, D.C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Abroma augusta (Sterculiaceae), 47349. **Abroma.** From Nice, France. Seeds presented by Dr. A. Robertson-Proschowsky, Jardin d'Acclimatation. A large spreading shrub, native of tropical Asia, with the large angled leaves and the branches covered with soft hairs. The large purple flowers occur in great profusion during the rains; and the seeds ripen in the cold season. The bark of the twigs yields a fiber, much valued for its great beauty, softness, cheapness, and durability, which might be used to advantage as a substitute for silk. The plant yields three crops a year. The bark of the root is used medicinally. (Adapted from Watt's Dictionary of the Economic Plants of India, vol. 1. p. 8.)

Achradelpha mammosa (Sapotaceae), 47424. **Sapote.** From Guayaquil, Ecuador. Seeds presented by Mr. Frederick W. Goding, American consul general. "A fruit about the size of a teacup, resembling a potato in general appearance, and having a rough, dark greenish brown skin mottled with sordid yellow. The edible portion is red, soft, and sweet, with a peculiar but pleasant flavor; in the center of the edible portion is a shuttle-shaped seed about two inches long, of a chestnut-brown color and always split along one side. Within the hard, thin, shining shell is a white kernel." (Goding.)

Annona squamosa (Annonaceae), 47434. **Sugar-apple.** From Rio de Janeiro, Brazil. Seeds presented by Mr. T. R. Day, Chief of the Industrial Department, Leopoldina Railway Co. Ltd. "Seed of the **pina (Fructo de Conde)**, of a very special variety. This is not the very large kind, but it is the best flavored I have ever found in the country. This fruit will no doubt grow in most parts of Florida and California, and possibly might do well in Arizona under irrigation." (Day.)

Butia capitata pulposa (Phoenicaceae), 47350. **Palm.** From Nice, France. Seeds presented by Dr. A. Robertson-Proschowsky, Jardin d'Acclimatation. "A hardy palm from southern Brazil, belonging to the same group as the species commonly cultivated in California as *Cocos australis*, *C. yatay*, and *C. eriospatha*. The trunk is 6 to 12 feet tall, by $1\frac{1}{2}$ to 2 feet in diameter, with rather short, abruptly arched leaves, 6 to 9 feet long. The petioles are armed with stout spines. The fruit is yellow, about 1 inch long by $1\frac{1}{4}$ inches in diameter, and the pulp is of a texture and taste somewhat like that of the pineapple." (C. B. Doyle.)

Caesalpinia sepiaria (Caesalpiniaceae), 47351. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky, Jardin d'Acclimatation. A large, climbing, prickly bush in the Himalayas, and extending to Ava and Ceylon; it ascends to 4,000 feet in altitude. Lac is gathered on the tree in Baroda. The bark is much used for tanning and the young pods contain an essential oil; in Chumba the bruised leaves are applied to burns. It makes an impenetrable hedge. (Adapted from Watt's Dictionary of the Economic Products of India, vol. 2, p. 12.)

Cucurbita pepo (Cucurbitaceae), 47378. **Squash.** From Shanghai, China. Seeds presented by Mr. F. J. White, president, The Shanghai Baptist College and Theological Seminary. "This squash is a greenish bronze in color, round, and ribbed; the flesh is remarkably thick and of very good quality. There is hardly any cavity at all inside the squash." (White.)

Dioscorea sp. (Dioscoreaceae), 47398. **Yam.** From St. Lucia, B. W. I. Tubers presented by Mr. Samuel Rosen, New York. "A white-fleshed yam of medium size. It is quite moist when cooked, but makes an excellent dish when mashed and beaten thoroughly." (Young.)

Echium wildpretii (Boraginaceae), 47356. From Nice, France. Seeds presented by Dr. A. Robertson Proschowsky Jardin d'Acclimatation. "This plant made its debut at Kew in 1899. It was raised there from seed sent in by Mr. Wildpret, curator of the Botanic Gardens, Orotava, Teneriffe. They were two years old when they flowered in May, and since then by sowing seeds annually, plants have been on show at Kew every spring. Even before the flower spikes develop, the plants are attractive; their leaves, covered with silky hairs, after the manner of the Silver Tree, form a handsome rosette 18 inches high and through. The flower spike adds another two feet to this height, and when the purplish pink flowers are all open, the plant is singularly handsome. I know no other like it. Certainly among the many plants grown at Kew for the conservatory, there is not one that attracts and pleases more than this Echium. The altitude at which it grows wild at Teneriffe has not been recorded, but it is probably some distance above sea level, and, therefore, the plant ought to be a good one for open-air gardening, if protected from the frosts." (W. Watson, Gardeners' Chronicle, Oct. 26, 1912, p. 317.)

Garcinia sp. (Clusiaceae), 47358. From Cienfuegos, Cuba. Seeds presented by Mr. Robert M. Grey, Harvard Experiment Station. "The tree, which is fairly rapid in growth, has large, leathery leaves 6 to 10 inches long. The orange-yellow fruits, borne singly or in clusters of three to five in the axils of the leaves on mature wood, are round, or tapering to an acute apex and are often over 2 inches in diameter. They are made up of three to five segments, each usually containing a large, oblong seed. The flavor of the ripe fruit is subacid and not excellent. The green fruit, when cut or injured, exudes a quantity of yellow gum." (Grey.)

Glycine priceana (Fabaceae), 47360. **Price's ground-nut.** From Hartsville, S. C. Collected by Mr. J. B. Norton, agricultural explorer for the Department, in September, 1918. "Seed from plants growing on the grounds of Mr. David R. Coker, Hartsville, S. C. I collected the original tuberous roots in October, 1917, at Bowling Green, Ky. Bowling Green is the type locality and the only known region where this wonderful bean grows wild. This plant is useful both as an ornamental and as a food plant." (Norton.) "Its tuberous roots are excellent when cooked like the West Indian yam."(Fairchild.)

Gossypium sp. (Malvaceae), 47397. **Cotton.** From Mustapha-Alger, Algiers. Seeds presented by Dr. L. Trabut. "I have received, from a correspondent at Djibouti, a cotton which he has selected and which he characterizes as 'Coton Gabod,' obtained at Djibouti, at Din Davona. It is satisfied with an annual rainfall of 300 millimeters (11¾ in.) in a very hot country, in siliceous-clayey soil; not irrigated for two years." (Trabut.)

Gynura sp. (Asteraceae), 47416. From Philippine Islands. Seeds presented by Mr. P. J. Wester, agricultural advisor, Zamboanga. "A climber with panicles of orange-colored flowers which have a pronounced odor similar to that of the field daisy. It is very floriferous. If it succeeds it would make a very striking and attractive climber. Collected at an elevation of 1,500 feet in Mindanao." (Wester.)

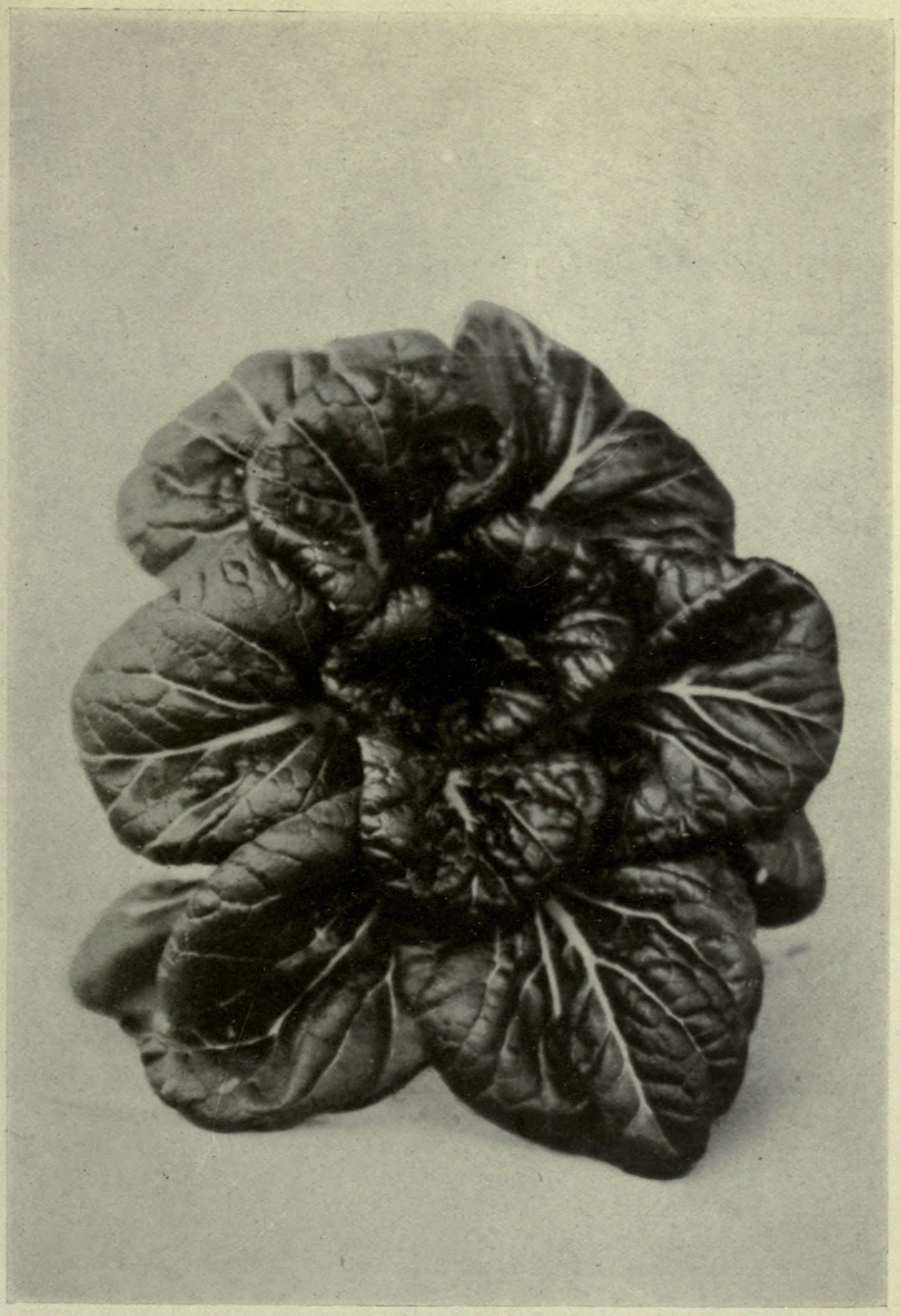
Hibiscus sabdariffa (Malvaceae), 47429 & 47430. **Roselle.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "Var. **Altissima.** Because of the fibrous and spiny character of the small

calyces of the two forms belonging to the **altissima**, they have no culinary value. However, their habit of growth is favorable to the production of a long fiber; and, according to Mr. M. M. Saleeby, chief of the fiber division of this Bureau, the two forms of this variety are far superior to jute and to all other varieties of **roselle** (including four from India) in habit, growth, and yield. As yet, the problem of utilization of the fiber of the **altissima** has not been carefully studied, but it is apparently suitable for all uses for which jute fiber is now employed." (Wester, Philippine Agricultural Review, June, 1914, p. 268.)

Ipomoea batatas (Convolvulaceae), 47432 & 47433. **Sweet potato.** From Mayaguez, Porto Rico. Tubers presented by Mr. T. B. McClelland, horticulturist, Porto Rico Agricultural Experiment Station. "Tubers of two varieties of the mamey type of sweet potato from the eastern part of the island. The donor distinguishes these as **mameyona** or 'large mamey' and **mameyita** or 'small mamey.' He prefers the **mameyita**, if it is eaten immediately after digging, but says that the **mameyona**, if kept for a week, has the better flavor. However that may be, both belong to the best type of Porto Rican [sweet] potato." (McClelland.)

Lithocarpus cornea (Fagaceae), 47365. From Hongkong, China. Seeds purchased from Mr. W. J. Tutcher, superintendent, Botanical & Forestry Department. "An oaklike tree with oblong, sharp-pointed evergreen leaves 2 to 4 inches long, which are smooth and green on the under side,- interesting particularly as bearing acorns as hard shelled as the nuts of the American hickory and which contain a kernel almost as sweet as the sweetest Spanish chestnut. Said to be a very showy ornamental as grown on the island of Hongkong. Young trees of this species grown from previous introduction are now growing at the following places in this country: Mitchell Station, Ala.; Los Angeles, Los Molinos, Pomona, and San Gabriel, Cal.; Merritt, Miami, Panasoffkee, and Ritta, Fla.; Pineville, Ky.; Landon, Miss.; Hope, N.M.; Sulphur, Okla.; Raywood, Tex.; and Salt Lake City, Utah." (Fairchild.) See Inventory No. 35, Pl. No. VI, for photograph of this tree.

Mammea americana (Clusiaceae), 47425. **Mamey.** From Guayaquil, Ecuador. Seeds presented by Mr. Frederic W. Goding, American consul general. "From the injured



THE NANKING CABBAGE, A WINTER VARIETY OF PAI TS'AI.
(BRASSICA PEKINENSIS. SEE S. P. I. NO. 45189.)

The dark-green bullate foliage with clear white midribs, long, wide, blanched stalks and celerylike habit make this variety, which is cultivated for greens, very attractive. Sown out in the fall, it should make an excellent early winter crop for the South Atlantic and Gulf States. (Photographed by Mr. Bisset at Brooksville, Fla., December, 1917; P23816FS.)

THE MANZANILLA, A CENTRAL AMERICAN FRUIT TREE. (CRATAEGUS STIPULOSA. SEE S. P. I. NO. 45575.)

The manzanilla, a species of hawthorn, grows wild and is also cultivated in the highlands of Guatemala. The fruits are prized by the Guatemalans for jellies and jams, but are also eaten stewed. Average fruits are an inch or more in diameter, yellow, with russet dots and a blushed cheek. The plant is easily grown and should succeed in California, Florida, and elsewhere in the subtropics. (Photographed by Wilson Popenoe at Santa Maria de Jesus, Guatemala, October 20, 1916; P16881FS.)

skin of the **mamey de cartagena** exudes a resinous, gummy juice which is much used for killing chigoes and lice when applied locally. Animals suffering with mange and sheep ticks are cured by washing in a decoction made by boiling the seed in water; if, however, ulcers are present, it should not be employed - a case is known of a dog suffering from mange and ulcers, but otherwise healthy, that died in two days after having been bathed twice in the solution. Used in the form of a cerate, it kills many varieties of insects. An infusion of the fresh or dry leaves, (one handful to a pint of water, in cupful doses) given during the intervals of fever, has repeatedly cured intermittents and remittents which did not yield to the quinine salts. The treatment should be continued for several days. A yellow, violet-scented liquor is made from the fruit and flowers, and is a very delicious beverage. The fruit eaten green or ripe, or in preserves, possesses beneficial stomachic qualities." (Goding.)

Pistacia chinensis (Anacardiaceae), 47362. **Chinese pistache.** From Peking, China. Seeds presented by Mr. Han, assistant director of the Chinese Forestry Bureau, through Mr. Paul S. Reinsch, American Minister at Peking. "The **pistache** tree is a fairly rapid grower. Its wood is good, durable, and much valued in making household furniture and agricultural implements. Its shoots are edible, and oil is extracted from its seeds. It is found in the central parts of China, especially along the northern side of the Yangtze valley. It is of great economic value." (Han.)

Phyllostachys pubescens (Poaceae), 47370. **Bamboo.** From Anderson, S. C. Rhizomes purchased from Mr. Rufus Fant. "Mr. Fant's account of this clump [from which these rhizomes were taken] is that about twenty years ago he saw the Giant Japanese Bamboo advertised in a florists' paper by H. H. Berger of San Francisco. He sent the money and bought a plant or rather a piece of rhizome; it died. He sent again and got a pot-grown plant; he was afraid that this was not hardy, so kept it potted for about five years, until it outgrew the pot, and then planted it out of doors where it now stands. In 1912 he formed the idea of starting a grove along a little stream which runs through Silver Brook Cemetery, not far from his house. So he took up a clump of bamboo in February and planted it there,-

we counted, together, 266 good-sized canes about thirty feet tall. One is 12½ inches in circumference 1 inch above the ground. The range is from 5 to 12½ inches in circumference. On each side of his house, Mr. Fant has plantings of the true Moso bamboo, *Phyllostachys pubescens*, or *P. mitis* as it was formerly called. On the right the clump had been cut back and was low and bushy; on the left the culms were tall, almost to the roof of the two-story house. Mr. Fant explained that the clump on the right had been killed or at least seriously injured by a freeze of 2° F., which occurred February 15, 1918. He had cut the bamboo to the ground as soon as the new growth began, April 15, so that the dead culms were annoying for only two months. By May 10, the bushy growth had attained its present height. This is an important fact, for it indicates how quick will be the recovery from frost injury and of how little consequence is the fact that once in a while the grove will be killed down. The house protected the clump on the sheltered side." (Fairchild, Report of Southern Trip, 1918.)

Rosa gentiliana (Rosaceae), 47359. **Rose.** From Witcombe, Gloucester, England. Seeds presented by Lady Harriet Thiselton-Dyer, "The Ferns." A rose which is abundant in the mountainous region of western Hupeh and eastern Szechuan, where it forms tangled masses 6 meters (18¼ ft.) or more in height. The numerous, large, white flowers are very fragrant and the anthers are golden yellow. The species is easily distinguished by its glabrous pale gray shoots and the three- to five-foliate leaves which are shining green above and very pallid beneath. (Adapted from Sargent, Plantae Wilsonianae, vol. 2, p. 312.)

Xanthosoma sp. (Araceae), 47361. **Yautia.** From Port-of-Spain, Trinidad, B. W. I. Corms presented by Mr. Claude Connell, through Mr. F. W. Urich, entomologist, Board of Agriculture. "A **yautia**, with reddish buds, received under the name of 'nut eddo.' The flesh of the corms is yellowish when cooked and of fair flavor." (Young.)

Notes on Behavior of Previous Introductions.

In a letter dated April 9, 1919, Mr. A. B. Stout, director of the laboratories, New York Botanical Garden, makes the following report: "I am having a

great time with the Chinese cabbage (*Brassica pekinensis*), the seed of which I obtained from your Department. I am sure you will be interested to hear a word about it. It turns out to be a most fascinating plant for the investigation of that type of sterility which I have been calling physiological incompatibility. It is especially favorable for such study for I can grow the plants in pots and get them to bloom any time in the year without heading up. I hope to publish a preliminary report on the plant sometime within the next year. As for growing the Chinese cabbage in garden culture, I found I could force them as one does early head lettuce and get fine cabbages before the hot season comes on. The plants were grown under glass until ready for the second transplanting, when they were put in the field. I also grew a crop late in autumn and banked them with leaves so we had fine heads to eat until New Year's dinner used up the last. Four plants of the late crop failed to form heads. These were left without protection and lived through the winter. I shall be interested to see what they do this spring. Evidently they will bloom without forming heads. My experience indicates that the plant can be forced quite successfully in spring. Of course, in such a plant as Chinese cabbage, the condition of incompatibility is not directly involved in the commercial crop. It might, however, develop during the isolation of certain strains to the extent of interfering with the maintenance of the strain. In plants in which the fruit or the seeds constitute the commercial product, and especially when the method of propagation is vegetative, incompatibility may limit very much the product as it does in so many of our fruits." – For photograph of an interesting form of this vegetable see **Pl. 239.**

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Saharanpur, India; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla.; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.; Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 159. JULY, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Achradelpha	1453	Markhamia	1456
Aleurites	1460	Monodora	1457
Botor	1454	Pahudia	1457
Carica	1454	Phaseolus	1457
Chlorophora	1454	Phytelephas	1458
Dioscorea 1455,	1460	Pongam	1460
Dracaena	1455	Saguerus	1458
Elaeis	1455	Spathodea	1459
Erythrina	1456	Stevia	1459
Ipomoea	1456	Trichoscypha	1460

Plates:

Pl. 241. A West African oil palm, near Bahia, Brazil, *Elaeis guineensis.*

242. A productive cherimoya tree at home, *Annona cherimola.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by Agricultural Explorers and Foreign Correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued July 28, 1919, Washington, D.C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Achradelpha mammosa (Sapotaceae), 47516. **Sapote.** From Laguna, P. I. Seeds presented by the Bureau of Agriculture, Manila. "One of the most important fruits of the Central American lowlands, well known to the Indians from time immemorial. It is wild in many regions, notably southern Mexico and Guatemala. It occurs most abundantly between sea level and 2,000 feet; at 3,000 feet it is still common, while at 4,000 it becomes scarce. It is generally believed that it will not succeed at 5,000 feet, but occasionally trees are seen at this elevation. In the highlands they are slow of growth and the fruit requires a long time to reach maturity. In the lowlands the sapote (Spanish orthography 'zapote') is a large forest tree, often 60 feet in height, with a thick trunk and stout branches. The Indians, when clearing land for coffee plantations, u ually leave the sapote trees they encounter, for the sake of their valuable fruits. The foliage is abundant, and light green in color; the leaves are clustered toward the ends of the branchlets, and are obovate or oblanceolate in outline, broadest toward the apex, and four to ten inches long. The flowers are very small, produced in great numbers upon the stout branchlets. The fruit is elliptical in form, commonly three to six inches in length but sometimes larger. The skin is thick and woody, with a russet surface, and somewhat scurfy. The flesh is salmon-red, finely granular in texture, sweet, and of almost cloying flavor, in poor specimens strongly suggesting a squash or pumpkin. The single seed is large, shining brown except on the rough, whitish, ventral surface, and is easily removed from the fruit. The Indians commonly eat the sapote out of hand. It is occasionally made into a rich preserve, however, and can be used in a few other ways. It is slightly inferior in quality to its near relative the injerto or green sapote (*Achradelpha viridis*) of Guatemala. The seed of the sapote is an article of commerce in Central America. The large kernel is removed, roasted, and used to mix with cacao in the preparation of chocolate. According to some of the Indians, it imparts flavor to the chocolate; others say it is done to increase the bulk of the latter. In view of the high price of chocolate it seems more likely that sapote seeds are used as an adulterant, rather than for their flavor. In southern Mexico and Central America this fruit is known as 'zapote' (from the Aztec 'tzapotl'); in Guatemala the Indians knew it under the Maya names 'saltul,' 'saltulul,' and 'tulul;' in Cuba

it is called 'mamey colorado;' and in the Philippines 'chico mamey.'" (Popenoe.) – See **Pl. 241.**

Botor tetragonoloba (Fabaceae), 47510. **Goa bean.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "**Seguidilla.** A climbing bean with four-winged pods, which when tender are used as string beans and are of excellent quality. They should be of great value in Porto Rico and Panama." (Wester.) "This species has fruited in Brooksville and its pods have been tested and found to be very palatable."(Fairchild.)

Carica candamarcensis (Papayaceae), 47524. From Ecuador. Seeds presented by Dr. J. N. Rose, Smithsonian Institution, Washington, D. C. "This Carica from Ambato (my No. 22354) is very different from the other Carica [S. P. I. No. 46623] collected by me in Ecuador. It has a stout thick trunk and a large round top. Unlike most of the other species, male and female flowers are borne abundantly on the same plant. The fruit is small, about three inches long, and has three, broad, low ribs. It is used chiefly in making dulces. It is grown in yards or gardens." (Rose.) – This tree is growing successfully at Berkeley, Cal. Mr. Ernest Robertson, of 4600 Brooklyn Ave., Los Angeles, Cal., writes as follows regarding the two plants of this same species sent him under 36969, in 1916: "I have just picked my first and only fruit, which is a hybrid, from one of the two plants of *Carica candamarcensis* which you sent me two years ago. Both proved to be female plants. I got some pollen from *C. papaya* and succeeded in setting two fruits, one of which is now ripe."

Chlorophora excelsa (Moraceae), 47497. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This is a valuable timber tree, native throughout most of tropical Africa. The wood is whitish, gradually changing to pale bay, and is durable and easily worked. The tree often reaches a height of 130 feet, with a diameter of 10 feet,– the trunk bare of branches for 60 feet. The thin, leathery, elliptical leaves are 6 to 7 inches long. The flowers, borne in dense spikes, are of two kinds: the pistillate are inconspicuous; the staminate have long, exserted, white stamens. The slightly fleshy fruits are greenish yellow. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 6, part 2, p. 22.)

Dioscorea alata (Dioscoreaceae), 47446. **Yam.** From Honolulu, Hawaii. Presented by Mr. J. E. Higgins, horticulturist, Hawaii Agricultural Experiment Station. "This yam, understood to be the best variety grown in Hawaii, has purple skin; when cooked, the flesh is a little dark and, like many other varieties, is somewhat moist. Besides being boiled and mashed – a favorite method of preparation – yams may be baked, or after being boiled, may be sautéd, or, like potatoes, may be made into a salad which is especially good." (Young.)

Dracaena sp. (Liliaceae), 47511. From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "This Dracaena may prove a good pot plant for the conservatory and of course for culture out of doors in Porto Rico and south Florida." (Wester.)

Elaeis guineensis (Phoenicaceae), 47504 to 47507. **Oil palm.** From Buitenzorg, Java. Seeds presented by the chief of the Division of Plant Breeding, Department of Agriculture. The oil palm is indigenous to the Guinea coast, where travelers found it used by the natives as early as the sixteenth century. From there it has gradually been disseminated throughout the tropics. The palm attains 15 to 20 meters in height; its trunk is erect and straight; the flowers are monoecious, and the pistillate ones develop into fruits (drupes) of the form and size of a prune, yellow or brownish when ripe, according to variety. These fruits, numbering 1,000 to 1,500 upon a raceme, have a hard, woody endocarp surrounded with a fibrous and at the same time fleshy pulp, varying in thickness according to variety, and containing much oil. The seed contains an oleaginous kernel which is exported to Europe under the name "palmiste." In his "Documents sur le palmier a huile," Chevalier mentions several varieties of this plant, differing in production and the quality of their oil. The development of improved varieties will be a matter of great importance. The racemes are harvested by natives who are very skillful in climbing the palms. The principal season of ripening is toward the end of the rains, but the harvest continues more or less throughout the year. The fruit yields two sorts of oils: one is extracted from the pulp "huile de palme," the other from the seed "huile de palmiste." "Huile de palme" is seen in Europe only in the solid state, since it does not become liquid at a lower

temperature than 40°C. It is orange-yellow in color. When fresh, it has a faint odor of violets and is employed by the natives very extensively in cooking. It becomes rancid very quickly. Commercially, it is used in soap-making. In its native home (Dahomey, for example), the oil is extracted by fermenting the fruits in jars for several days; they are then mashed, the nuts are taken out, and the pulp is boiled in large kettles of water. The oil rises to the surface of the water and is skimmed off. Its purification is later brought about by boiling it for some time. The nuts, clean of pulp, are then broken with stones or hammers. The kernel, "palmiste," is removed and dried, after which it is ready for use. These dried kernels are exported to Europe, and yield, under pressure, 40 to 42 per cent palmiste oil, which is white, and has a melting point of about 25°C. This oil is employed in the making of fine soap. (Adapted from Capus et Bois, Les Produits Coloniaux, 1912, p. 294.)

Erythrina excelsa (Fabaceae), 47498. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. An ornamental tree, native to upper Guinea, growing to a height of 60 feet. It has glabrous branches which are armed with numerous sharp, straight, short prickles. The leaves are trifoliate, the broadly ovate central leaflet being 9 inches long. The bright scarlet flowers are borne in dense racemes about 6 inches long. (Adapted from Oliver, Flora of of Tropical Africa. vol. 2, p. 183.)

Ipomoea cairica (Convolvulaceae), 47532. **Morning glory.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "Seeds of a white-flowered variety of *Ipomoea cairica*, extremely attractive and floriferous. Unlike most plants of this family, *I. cairica* is ever-blooming. The mauve-colored variety is the most popular climber in the Philippines and very rarely seeds, being propagated by cuttings. The plant from which these seeds were obtained is the only one with white flowers I have seen." (Wester).

Markhamia platycalyx (Bignoniaceae), 47499. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. A tree, 30 to 40 feet high, known in Uganda, where it is native, under the name **lusamabia.** It is said to yield the finest of local timbers. The compound leaves are made up of 5 to 9

A WEST AFRICAN OIL PALM, NEAR BAHIA, BRAZIL. (ELAEIS GUINEENSIS. SEE S. P. I. NO. 36973.)

The rapidly growing importance of the vegetable oils and the rank taken by this palm as an oil producer make it worth calling to the special attention of tropical plantation owners. In West Africa plantations of great size are being planted, and the British soap manufacturers have been recently given immense concessions of land in the Belgian Kongo for its culture. Like the coconut palm, this species deserves to be planted widely in the American Tropics, where it is as yet little known. (Photographed by P. H. Dorsett at Cabulla, Bahia, Brazil, December 13, 1913; P14509FS.)

A PRODUCTIVE CHERIMOYA TREE AT HOME. (ANNONA CHERIMOLA. SEE S. P. I. NO. 45021.)

This rather small tree was carrying over a hundred young fruits at the time it was photographed, and it was still flowering. The ripe fruits weighed about a pound each and were said to be of excellent quality. The productiveness of the tree and the high quality of the fruit commend it for trial in California and Florida. (Photographed by Wilson Popenoe at Antigua, Guatemala, October 26, 1916; P16915FS.)

obovate leaflets and the flowers, which are yellow striped with red, are borne in axillary and terminal panicles. (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 4, part 2, p. 525.)

Monodora myristica (Annonaceae), 47500. **Calabash nutmeg.** From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. A large, ornamental tree, native to Africa. The shining, pale green leaves are confined to the ends of the branches. The fragrant flowers, borne singly in the axils of the leaves, are about six inches across, with three spreading, wavy-margined, yellow petals, and three erect, creamy white petals, all six of which are dotted with red. The fruit, four to six inches in diameter, contains a number of cylindric seeds each about one inch long, which have a flavor closely resembling that of the nutmeg. (Adapted from Curtis's Botanical Magazine, pl. 3059.)

Pahudia africana (Caesalpiniaceae), 47501. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This large, forest and timber tree is a native of the Niger and Congo valleys in western Africa. The small, white and red, fragrant flowers are borne in lax or dense racemes and are followed by smooth, thick, woody pods containing about ten seeds. (Adapted from Oliver, Flora of Tropical Africa, vol. 2, p. 302.)

"A useful tree for timber and shade. The wood is hard and durable---, and the bulk of the timber appears to be figured and of great value. It is frequently exported to Europe under the general trade name of 'African mahogany'". (Useful Plants of Nigeria, vol. 2, p. 272.)

Phaseolus lunatus (Fabaceae), 47447. **Lima bean.** From Guelph, Ontario, Canada. Presented by Mr. Jas. A. Neilson, Ontario Agricultural College. "Lima beans which were grown near Iroquois, Ontario, in the garden of Mr. Leigh Harkness. Mr. Harkness states that this strain of beans has been grown by members of his family since 1876. The seed was first secured from a seedsman in Philadelphia, Pa. During the first few years that the beans were tried at Iroquois, comparatively few ripened; but through selection of the earliest maturing and most productive plants for seed, a strain has been isolated which matures in a latitude

which is farther north than where lima beans can usually be grown. During the past summer I had the privilege of going through Mr. Harkness's garden and was very favorably impressed with the fine appearance of the beans. The plants were not very large, being about 16 to 18 inches in height and of about the same breadth, but they were very productive. I will venture to say that some of the plants produced as many as 75 pods of from 3 to 4 inches in length. Iroquois is in Dundas County and is approximately 44° 45' N. latitude. Considering the fact that lima beans are native to climates which are much warmer than that of the St. Lawrence River Valley, I think that Mr. Harkness has secured very good results." (Nielson.)

Phytelephas macrocarpa (Phoenicaceae), 47513. **Ivory-nut palm.** From Para, Brazil. Burs purchased from Mr. George H. Pickerell, American consul. An arborescent palm with a thick, rough, creeping trunk, from the under surface of which roots are given off; native to South and Central America. The leaves, which crown the trunk, closely resemble those of the coconut palm in size, shape, and disposition. The flowers emit a strong perfume,—especially the large, white, pistillate flowers which are, however, few in number. The fruits grow on the trunk just above the bases of the leaves in bunches of 6 or 7, and are called **cabeza de negro** by the natives of Colombia. The albumen of the seed is the so-called vegetable ivory, and this becomes whiter and more opaque on exposure to the air. (Adapted from The West Indian Bulletin, vol. 9, p. 279, 1908.)

Saguerus pinnatus (Phoenicaceae), 47527. **Sugar palm.** From Mayaguez, Porto Rico. Seeds presented by Mr. D. W. May, Porto Rico Agricultural Experiment Station. "The **gomuti** or **sugar palm** is one of the most useful of palms, and occurs in a wild state throughout the islands of the Indian Archipelago, but is more common in the interior, principally in the hilly districts, than on the sea coast; it is also very generally cultivated by the various people who inhabit that region. It is indigenous to Sunda and the Philippines, and is cultivated generally in tropical Asia. This palm attains a height of thirty to forty feet, and besides its saccharine sap furnishes a highly valuable, black, fibrous substance, ejoo fiber, superior in quality, cheapness, and durability to that obtained from the husk of the

coconut, and renowned for its power of resisting moisture. It is used by the natives of the Indian islands for every purpose of cordage and is known as 'tsongli'. Underneath this material is found a substance of a soft, gossamer-like texture, which is imported into China. It is applied as oakum in caulking the seams of ships, and more generally as tinder for kindling fire, - it is for the latter purpose that it is chiefly in demand among the Chinese. In Malacca, the **gomuti**, there termed 'kabong', is cultivated principally for the juice which it yields for the manufacture of sugar." (Simmonds, Tropical Agriculture, p. 252.) - Although the leaves of this **sugar-palm** were cut back by the fall frost, in Bay City, Fla., the trunk and body were not injured, and the tree is thriving.

Spathodea nilotica (Bignoniaceae), 47502. From Entebbe, Uganda. Seeds presented by the chief forestry officer, Forestry Department. This is a bushy, very beautiful, flowering tree, up to 20 feet in height, native to the Upper Nile Valley and the Belgian Congo. The opposite leaves are made up of 9 to 15 leathery leaflets covered with dense, short hairs beneath. The bright scarlet flowers are borne in short, dense, terminal racemes and resemble closely those of the well-known *S. campanulata.* (Adapted from Thiselton-Dyer, Flora of Tropical Africa, vol. 4, part 2, p. 529.)

"As *S. campanulata* has flowered in south Florida, even though tender, it is to be hoped that *S. nilotica* may prove hardier, and, if really as beautiful, it will be a valuable addition to the ornamentals of that region." (Fairchild.)

Stevia rebaudiana (Asteraceae), 47515. **Kaa-Hee.** From Asuncion, Paraguay. Seeds presented by Mr. H. H. Balch, American consul. "This Paraguayan herb is of peculiar interest because of the remarkable sweetness of the leaves. A fragment placed on the tongue seems as sweet as a lump of sugar of similar size. Several years ago the discovery that this plant, then called Eupatorium, contained a substance many times sweeter than sugar was heralded by the press and excited the keen interest of sugar planters all over the world. The substance turned out to be a glucoside and the anxiety of the sugar interests subsided. Further investigations, however, are now being made with this plant, by biological chemists and dieticians, because of the possibilities of utilizing sweet

substances to take the place of sugar in the food of persons suffering with certain diseases." (Fairchild.)

Trichoscypha sp. (Anacardiaceae), 47519. From Loanda, Angola, Africa. Seeds presented by Mr. J. Gossweiler. "No.6882. A dioecious, palm-shaped tree, 25 meters in height, which produces on its trunk, about 2 meters above the ground, large bunches of peachlike, edible, succulent fruits. Quite a distinct, curious, and ornamental plant from the Portuguese Kongo. March, 1919." (Gosswieler.)

Notes on Behavior of Previous Introductions.

A letter received May 21, 1919, from Dr. H. Nehrling, Palm Cottage Gardens, Gotha, Fla., gives the following information:

"May 30, 1907, I received from you a tuber of *Dioscorea divaricata*, S. P. I. No. 10312, which has proved a great success. It is as good as the best potato, and is a most valuable root crop. The plant makes a tremendous growth - I have measured vines that were 60 feet long - and in rich, rather moist soil the tubers attain a weight of over a hundred pounds in two years. The foliage is very dense and the stems are provided with blunt spines. It flowers late in November and the three-cornered blossoms, almost pure white, exhale a delicious perfume.

"My *Aleurites fordii* (S. P. I. No. 21013) is now a fine tree 25 feet high. Several seedlings, only a year old, and a foot high, flowered and set fruit."

The following analysis by Dr. Frederick B. Power, of the Bureau of Chemistry, will interest all those who have grown this attractive tree, *Pongam pinnata*, which flourishes luxuriantly in south Florida.

"The perfectly sound seeds amounted to 7,548 grams, and, on separating the kernels from the shells, the weight of the kernels was found to be 3,811 grams, or 50.5 per cent of the weight of the entire seed. A portion of the kernels was completely extracted with ether, when the yield of the fatty oil was 26.97 per cent. This would be equivalent to 13.4 per cent of the entire seed. The oil thus obtained was a pale yellow, limpid liquid having a very slight odor and a specific gravity of 0.9371 at 15.6° C. (60° F.)"

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, and Wilson Popenoe, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, Miss Bessie Broadbent, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah. Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran. Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Saharanpur, India; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla ; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.; Dr. F. A. Woods, Washington, D. C.

PLANT IMMIGRANTS.

No. 160. AUGUST, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acer 1465,	1474	Ipomoea	1470
Actinidia	1465	Jubaea	1470
Amerimnon	1465	Juglans	1475
Anemone	1465	Kokia	1470
Arundinella	1466	Lonicera	1475
Berberis	1466	Lycopersicon	1470
Bucklandia	1466	Meryta	1471
Buddleia 1466,	1475	Metrosideros	1471
Caryocar	1467	Ochroma	1471
Coffea	1467	Phyllocladus	1472
Coix	1467	Populus	1475
Cotoneaster 1468,	1475	Prunus 1472, 1473,	1474
Dioscorea	1469	Saguerus	1473
Diospyros	1475	Sophora	1475
Dolichos	1469	Trifolium	1474
Elaeagnus	1475	Ulmus	1474
Hymenaea	1469		

Plates:

Pl. 243. A pear that gives some promise of resistance to blight, *Pyrus calleryana.*

244. A drought-resistant pear stock from China, *Pyrus calleryana.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by agricultural explorers and foreign correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued August 28, 1919, Washington, D.C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acer campbellii (Aceraceae), 47629. **Maple.** From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. The principal maple of the northeastern Himalayas, where it grows at an altitude of 7,000 feet and more. The leaves are a beautiful green with red petioles. The grayish white, close-grained wood is moderately hard and is extensively used for planking and for tea boxes. The tree reproduces freely by seed or by coppice, and plays an important part in the regeneration of the hill forests. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 1, p. 69.)

Actinidia kolomikta (Dilleniaceae), 47623. Grown at the Yarrow Plant Introduction Field Station, Rockville, Md., and numbered for convenience in distribution. "A large-growing, deciduous, ornamental climber, native to Amur, China, and Japan. The flowers are ½ to ⅝ of an inch in diameter, white with purple stamens, and are produced in abundance. The fruit is the size of a gooseberry or small plum, and has somewhat the flavor of the former. The foliage is deep green tinted with red and is very ornamental." (Johnson.)

Actinidia strigosa (Dilleniaceae), 47633. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A shrubby climber, native of Sikkim, India, with white flowers in axillary cymes, and edible, ovoid, mucilaginous fruits a little more than an inch in length. (Adapted from Hooker, Flora of British India, vol. 1, p. 286.)

Amerimnon sissoo (Fabaceae), 47637. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. "The timber is very valuable, and is one of the numerous kinds which are known in the timber trade as rosewood. The heartwood is brownish, and it possesses great strength and elasticity. It is also heavy, its weight being about 50 lbs. to the cubic foot. The wood is used for all kinds of joinery and cabinet work, carving, building material, gun carriages, etc. It requires a tropical or subtropical temperature." (Gardeners' Chronicle, Jan. 31, 1914.)

Anemone vitifolia (Ranunculaceae), 47639 From Darjeeling, India. A collection of seeds presented by

Mr. G. H. Cave, director, Lloyd Botanic Garden. This Himalayan plant resembles in many respects the well-known Japanese anemone. The woolly foliage, however, is thicker and larger. The large flowers are pure white, and are produced very freely during the summer months. This plant is not quite so hardy as its Japanese relative. (Adapted from Gardeners' Chronicle, Feb. 24, 1917, p. 88.)

Arundinella hispida (Poaceae), 47641. **Grass.** From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A perennial grass, with a stout, hard, creeping rootstock, and with a simple or branched stem from 1 to 5 feet in length. The leaves are narrow or broad and from 6 to 12 inches long, and the panicles are 4 to 18 inches in length. This grass is abundant throughout the hilly parts of India, and is distributed through the East Indies, South Africa, Australia, and tropical America. In São Paulo, Brazil, it is considered a good forage plant for dry lands. (Adapted from Correa, Flora do Brazil, p. 128; and Hooker, Flora of British India, vol. 7, pp. 73, 74.)

Berberis insignis (Berberidaceae), 47645. **Barberry.** From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. "This magnificent species forms a large bush, with deep green leaves 7 inches long, and bunches of yellow flowers." (Hooker, Himalayan Journals, vol. 1, p. 340, 1855.)

Bucklandia populnea (Hamamelidaceae), 47649. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A large evergreen tree, up to 80 feet in height, native to the eastern Himalayas at altitudes of 3,000 to 8,000 feet. The wood is grayish brown, close grained, and durable, and is very much used in Darjeeling for planking and for doors and window frames. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 1, p. 545.)

Buddleia asiatica (Loganiaceae), 47650. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Gardens. A graceful, large shrub or small tree, common throughout India and the Malay Peninsula, ascending to 6,000 feet

A PEAR THAT GIVES SOME PROMISE OF RESISTANCE TO BLIGHT. (PYRUS CALLERYANA. SEE S. P. I. NO. 45687.)

While no pear has as yet been found thoroughly resistant to pear blight, strains of this remarkable Chinese species are showing great promise. This fact, coupled with the unusual adaptability to habitat already shown, makes this pear of great interest to growers. (Photographed by F. N. Meyer at Koomooshu, Hupeh, China, April 4, 1917; P13269FS.)

A DROUGHT-RESISTANT PEAR STOCK FROM CHINA. (PYRUS CALLERYANA. SEE S. P. I. NO. 45687.)

Dwarf wild plants thriving in sterile, decomposed, porphyritic rock on a greatly eroded mountain top in central China. This photograph, compared with the next, shows the widely different conditions to which this pear adapts itself. (Photographed by F. N. Meyer at Nanchangyen, Hupeh, China, March 31, 1917; P13267FS.)

in the Nilghiri Hills. The lanceolate leaves are 4 to 8 inches long, and the small, white, sweet-scented flowers are borne in long, slender, spikelike racemes. This plant flowers continuously for three months in India. (Adapted from Curtis's Botanical Magazine, pl. 6323.)

Caryocar sp. (Caryocaraceae), 47587. From Colombia. Seeds collected by Mr. Alfred Lenz, Flushing, Long Island. "This genus yields the souari nut, sometimes exported from South America to Europe. There are several species which produce edible nuts. Probably the only section of the United States in which they can be planted with reasonable hopes of success is extreme south Florida." (Popenoe.)

Coffea bengalensis (Rubiaceae), 47661. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. This shrub, which is a close relative of the plant which furnishes the coffee of commerce, is a native of India, and is remarkable for the number and beauty of its flowers. These flowers, which are large and white, are borne singly or in pairs at the ends of the branches. (Adapted from Curtis's Botanical Magazine, pl. 4917.)

Coix lacryma-jobi (Poaceae), 47617. **Job's-tears.** From Rio de Janeiro, Brazil. Seeds presented by Mr. T. R. Day, through Mr. Augustus I. Hasskarl, American vice consul, Rio de Janeiro. "'Lagrimas de Nossa Senhore' (Tears of Our Lady). I found this plant growing in a natural state in Brazil and have had it under experiment for about three years at one of the Leopoldina Railway Company's Experiment Stations. It is a very vigorous grower, and produces under almost any conditions here great crops of excellent forage. It reaches a height of 10 feet or over, and a single plant often produces 40 to 50 shoots. The yield in green forage under favorable conditions runs very high, from 10 to even 20 tons to the acre, and the yield of grain is also very heavy. The seeds are very hard and require crushing or grinding before feeding if allowed to mature. But I am of the opinion that the best results may be obtained from the use of the plant for soiling, cutting four or five times during the year. The plant stools well, continually sending up new shoots or stems, thereby renewing itself, and lasting here for some years. In temperate climates it would be an annual, as in the case of teosinte and maize. Its favorite habitat is

a low, moist, or even marshy soil, but it will grow successfully in dry soil also. I have seen it growing luxuriantly in very wet localities, even in water." (Day.)

Cotoneaster frigida (Malaceae), 47664. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. "Of the stronger-growing Cotoneasters this is perhaps the best, for it grows into a very large bush, or sometimes a small tree, and rarely fails to fruit freely, the branches from late September onwards being laden with large clusters of bright red fruits. Moreover, it is more attractive when in flower than many of the Cotoneasters, the flowers being creamy white and produced in large cymes. Although a deciduous species, the leaves are often retained until well into winter, and after a mild autumn it not infrequently happens that many leaves are left until January. The fruit also remains until well into the New Year if not troubled by birds. It is a Himalayan plant, and succeeds in a light and sunny position in good loamy soil." (The Garden, Nov. 18, 1916.)

Cotoneaster rotundifolia (Malaceae), 47665. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. One desirable feature of this Cotoneaster used as an ornamental plant is that the berries are less attractive to birds than those of any of the other kinds. This is a very important point, as some members of the genus are very quickly robbed of their beauty after the berries color. *C. rotundifolia* is one of the Himalayan species, several of which run into each other by almost imperceptible gradations, so that, as might be expected, a certain amount of confusion attends their nomenclature. The true *C. rotundifolia* is a beautiful shrub, usually forming a rather spreading bush 4 or 5 feet in height, clothed with small, dark green, roundish leaves, many of which are retained throughout the winter, unless the weather is particularly severe. The berries, which are about the size of peas, are very freely borne, and, being of a deep scarlet hue when ripe, the bush makes a goodly show, and, as above stated, the birds leave it alone until the last. (Adapted from Journal of Horticulture and Home Farmer, Dec. 18, 1913.)

Dioscorea sp. (Dioscoreaceae), 47564. **Yam.** From Bahia, Brazil. Tubers presented by Mr. V. A. Argollo Ferrão. "'Inhame figado de piru,' or 'caissara' [turkey-liver yam, – on account of the shape of the aerial tubers]. This very interesting inhame is cultivated here in some localities but is rare and is not found in the markets. The tubercles are borne on the vine. I had a few last year and planted them in December, when they were starting. I am now (April 28) picking the crop. The tubercles I have eaten were boiled and I found them very good. I think it is a plant worth propagating, for it gives an excellent substitute for the potato, is productive, and the tubercles keep for several months without deterioration." (Argollo.)

Dolichos lablab (Fabaceae), 47568. **Bonavist bean.** From St. Vincent, B. W. I. Seeds presented by Prof. S. C. Harland, assistant for cotton research, Agricultural Experiment Station. "'St. Vincent Bush.' I discovered this type in a peasant's holding in St. Vincent in the spring of 1915 and found that it bred true when put into pedigree culture. Under cultivation it produces a wiry bush of from 1½ to 2 feet in height, and bears a heavy crop when environmental conditions are favorable. As a cover crop for orchards in Florida I think it is worth a trial. With me the plants of the bush Dolichos always flower when 5 weeks old and ripe pods are produced at 8 weeks. Often a second crop of pods is produced. The beans are quite palatable, though they are inferior to Lima beans. I should mention that in the course of my inheritance studies on Dolichos, I have established that the bush form behaves as a simple Mendelian recessive to the climbing form. In a cross between 'St. Vincent Bush' (white) and 'Purple Soudan' climber, I have isolated pure bush types of varying vegetative habits. Some are much more vigorous than the original bush parent. I have also succeeded in isolating a bush form of 'Vilmorin's Stringless,' by crossing 'Stringless,' with the native bush." (Harland.)

Hymenaea courbaril (Caesalpiniaceae), 47559. **Courbaril.** From Puerto Cabello, Carabobo, Venezuela. Fruits presented by Mr. J. G. Meyer, American vice consul. This important tree flourishes throughout the tropical parts of the western hemisphere. The pods contain an edible substance surrounding the seeds, and the wood is fine grained, hard and heavy. The principal use of the tree is in furnishing South American copal, – a

gum which exudes from wounds in the bark [and is also said to exude naturally from the roots and lower part of the trunk]. Some of the trees in the Brazilian forest are 6 feet in diameter above the buttresses and are estimated to be more than 1,000 years old. These trees produce large quantities of gum during their lifetime and the spot in which one has stood often yields 5 to 10 barrels of the best gum, which is used in the manufacture of varnishes. (Adapted from Bulletin of the Pan-American Union, October, 1916.)

Ipomoea cairica (Convolvulaceae), 47532. **Morning-glory.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "Seeds of a white-flowered variety of *I. cairica*, extremely attractive and floriferous. Unlike most plants of this family, *I. cairica* is ever-blooming. The mauve-colored variety is the most popular climber in the Philippines and very rarely seeds, being propagated by cuttings. The plant from which these seeds were obtained is the only one with white flowers I have seen." (Wester.)

Jubaea chilensis (Phoenicaceae), 47578. **Palm.** From Miami, Fla. Plants grown at the Plant Introduction Field Station at Miami. "This is the palm from which the palm honey of Chile is made. This syrup is the most delicious I have ever tasted. It is superior, in my estimation, to maple syrup, being milder, and not cloying the palate as the latter does. In forty years the trees will be ready to tap for the sap from which this syrup is made. It is a very ornamental palm but a slow grower. It thrives on poor, very dry soils and requires very little water. Hitherto palms have been felled but they can be tapped, I am assured, just as maple trees are tapped." (Fairchild.)

Kokia rockii (Malvaceae), 47561. From Honolulu, Hawaii. Presented by Mr. J. F. Rock. "Seeds of a new variety of *K. rockii*, from the island of Kauai, discovered by Mr. A. Knudsen. There is only one specimen of the tree; it grows in the very dry region of Kauai, several miles from Mana, in Koaloha canyon, - on the edge of a cliff, which saved it from destruction by cattle. I think the discovery of this form is one of the most noteworthy since the days of Hillebrand." (Rock.)

Lycopersicon esculentum (Solanaceae), 47526. **Tomato.** From Naples, Italy. Presented by the Museo Commerciale

e Coloniale of Naples, through Mr. B. Harvey Carroll, Jr., American consul. "Tomato seed of the variety 'fiascone' or 'fiaschetti' of which the English translation would be 'little flagons' on account of the shape of the tomato. This is the type of tomato most largely grown in this consular district and most used for canning and for making tomato paste." (Carroll.)

Meryta sinclairii (Araliaceae), 47570. From Auckland, New Zealand. Seeds presented by Mr. James W. Poynton. "Native name 'puka.' The meryta has large leaves, and is rather a striking-looking small tree, much grown in gardens for ornament. For a time it was believed to be the rarest tree in the world, - only one plant being known. One of our early botanists saw a tree near a large native camp, but the Maoris declared it was 'tabu' and forbade him under penalty of death to touch it. He reported its discovery and described it as accurately as he could. No other naturalist had ever seen such a tree in New Zealand and much interest was aroused by his report. Twelve years afterward he returned to the place and found the camp deserted; but the tree was still there. He got some leaves and flowers and sent them to the eminent botanist, Sinclair, who classified it, and it is now named after him. Subsequently 27 plants were found on some islands in the Hawaki Gulf near Auckland and from them seeds were obtained for distribution. The plants are male and female." (Poynton.)

Metrosideros tomentosa (Myrtaceae), 47571. From Auckland, New Zealand. Seeds presented by Mr. James W. Poynton. "The Christmas tree of our early settlers; native name 'pohutukawa.' It comes into bloom mostly during Christmas week (midsummer here). The flowers are deep red and the tree is very pretty when in flower. It grows well by the seaside, gives good shelter, and endures salt spray splendidly. The wood is hard and durable but the tree does not grow straight, being bent at the branches. For this reason it was much sought after for knees for boat building." (Poynton.)

Ochroma lagopus (Bombacaceae), 47593. **Balsa wood.** From Santiago de las Vegas, Cuba. Seeds presented by Mr. M. Calvino, director, Agricultural Experiment Station. A wild tree, rather abundant, growing about 40 feet high and a foot or more in diameter. The wood is white, stained with red, luminous in aspect, and sometimes silky. It is very porous, the lightest of

all woods, lighter even than cork. In Trinidad and other places it forms an article of commerce with fishermen, who use it in place of cork on their nets. (Adapted from Cook and Collins, Economic Plants of Porto Rico, p. 205.)

Phyllocladus trichomanoides (Taxaceae), 47573. From Auckland, New Zealand. Seeds presented by Mr. James W. Poynton. "Cones of the remarkable 'celery-topped pine'; native name 'tanekaha.' The bark contains two valuable red dyes and about 22 per cent of tannin. When about 18 months old the leaves become aborted and the leafstalks expand, become leaflike, and take on all the functions of leaves, as do some of the acacias, but I believe the 'tanekaha' is the only pine with this habit." (Poynton.)

Prunus serrulata (Amygdalaceae), 47567. **Flowering cherry.** From Chevy Chase, Md. Seeds collected by Dr. David Fairchild at his home, "In The Woods." "'Daizen.' Seeds from a tree at the southeast corner of my study. This tree and, in fact, all the other 'Daizen' trees on my place, have characterized themselves by their regular fr iting habit, the cherry fragrance of their single white flowers, and the vigor of their trunks and freedom from suckers. They have been particularly free from disease and have struck me as promising for stock purposes. These trees were bought originally from the Yokohama Nursery Co., Yokohama, Japan, in the spring of 1906, and are now 13 years old and 20 feet or so high with trunks about 6 inches in diameter. It is possible of course that the plants from these seeds will show the result of crossing with other of the varieties such as 'Murasaki,' 'Jobeni,' and 'Naden,' with which they are closely planted." (Fairchild.)

The tree has made thrifty growth at Boise, Idaho, and at San Jose and Kerman, Calif.

Prunus subhirtella autumnalis (Amygdalaceae), 47534. From Chevy Chase, Md. Seeds collected by Dr. David Fairchild, at his home, "In The Woods." "Seeds from a tree of the 'October-blooming' Japanese flowering cherry imported from the Yokohama Nursery Co., Yokohama, Japan, in 1906. I suggest it as a stock for commercial cherries because of its unusual vigor, the fact that its trunk has been very free from disease, that it does not sucker, that its seedlings are not subject to the usual leaf blight (*Cylindrosporium padi*),

and that the seeds are regularly produced. The flowers are single and are produced both in autumn (October) and spring (about April first)." (Fairchild.)

Prunus subhirtella pendula (Amygdalaceae), 47535. **Rosebud cherry.** From Chevy Chase, Md. Seeds collected by Dr. David Fairchild, at his home, "In The Woods". "Drooping Japanese cherry seed gathered from trees imported in 1906 from the Yokohama Nursery Co., Yokohama, Japan. The unusual vigor of these drooping cherry trees, the fact that they belong to a long-lived species which in Japan grows to be 300 years old, combined with the facts that the seedlings are free from the *Cylindrosporium padi* disease which attacks the Mazzard seedlings, that their trunks are vigorous and are free from diseases such as gummosis, and also that the trees bear abundant crops of seeds would seem to indicate that it is worth testing as a stock for our cultivated cherries. I have grown seedlings, and find that they are quite uniform though some appear to have the drooping habit whereas others are upright in growth. No leaf blight has been observed among them. Seed gathered June 5 or 6, 1919." (Fairchild.)

Saguerus pinnatus (Phoenicaceae), 47527. **Sugar palm.** From Mayaguez, Porto Rico. Seeds presented by Mr. D. W. May, Porto Rico Agricultural Experiment Station. "The 'gomuti' palm is one of the most useful of palms, and occurs in a wild state throughout the islands of the Indian Archipelago, but is more common in the interior, principally in the hilly districts, than on the sea coast; it is also very generally cultivated by the various people who inhabit that region. It is indigenous to Sonda and the Philippines, and is cultivated generally in tropical Asia. This palm attains a height of 30 to 40 feet, and besides its saccharine sap furnishes a highly valuable, black, fibrous substance, Ejoo fiber, superior in quality, cheapness, and durability to that obtained from the husk of the coconut, and renowned for its power of resisting moisture. It is used by the natives of the Indian islands for every purpose of cordage and is known as 'tsongli.' Underneath this material is found a substance of a soft, gossamer-like texture, which is imported into China. It is applied as oakum in caulking the seams of ships, and more generally as tinder for kindling fire, - it is for the latter purpose that it is chiefly in demand among the Chinese. In Malacca, the 'gomuti', there termed 'kabong', is cultivated principally for the juice which

it yields for the manufcture of sugar." (Simmonds, Tropical Agriculture, p. 252.)

Trifolium panormitanum (Fabaceae), 47597. **Palermo clover.** From Algiers, Algeria. Seeds presented by Dr. L. Trabut. "A clover, closely resembling *T. alexandrinum*, which grows vigorously in damp places along the coast. It is easily distinguished by its dark green color and its larger leaves. This clover makes a good forage but does not as yet lend itself readily to cultivation. Hybridization experiments with berseem are being carried on. This **Palermo clover** shows local variations which should be studied." (Trabut.)

Notes on Behavior of Previous Introductions.

A letter dated June 2, 1919, from Mr. F. T. Ramsey, of Austin, Texas, states the following:

"Late in the spring of 1916, we received from your Department 10 trees of the Methley plum (*Prunus salicina x cerasifera myrobalana*), S. P. I. No. 41652, from Natal. They were planted April 20, 1916, so late that they barely lived through that summer; and last year and the year before were the driest ever known in this country. But today the 10 trees are living and have a fine crop of red-fleshed, delicious fruit. We have tested, on our own place, several hundred varieties of plums and have larger ones ripening now, but this one probably 'takes the cake' for quality of texture and flavor among the very early plums. The trees are ideal in appearance, outline, and vigor. The fruit is borne largely on the old limbs, so that the young limbs do not break off easily. Jam or jelly made from these plums will equal in brilliancy, or color, that from either Satsuma or Sultan. Sultan has proved to have a weak constitution in our climate, and Satsuma does not come into bearing at as early an age, nor does it bear as profusely, as the Methley plum. Satsuma is of little, if any, better quality, although it ripens at least a month later."

Mr. Rolla Meyer, of Horse Shoe Bend, Idaho, makes the following report, April 21, 1919:

Ulmus pumila (S. P. I. No. 22975) is a particularly lovely tree; mine, received in 1917, is now 14 feet high, 2½ inches in diameter, with a beautiful frondlike system of branches. *Acer truncatum* (S. P. I. No. 18578) stated to be 'half-hardy in Ottawa,' is

hardy here, and beautiful, but, so far, rather shrubby. *Sophora davidii* (S. P. I. No. 21967) is interesting as material for hedges and bee pasture. The ends of some of the fine twigs die back over winter, for a few inches, somewhat like some standard nursery varieties of Russian mulberries; but it goes ahead every spring. The following are hardy here and doing well: *Populus simonii*, 22363; *Juglans regia*, 44200; *Diospyros lotus*, 27512; *Lonicera sp.*, 39697; *Buddleia davidii*, 43677; *Elaeagnus angustifolia*, 28806; *Cotoneaster rotundifolia*, 32937, and *C. integerrima*, 33156, are hardy, and the leaves persist over winter."

The following introduction was received from the Arnold Arboretum, Jamaica Plain, Mass., November 16, 1917:

Pyrus calleryana (S. P. I. No. 45687) is a widely distributed species and according to Wilson is common in western Hupeh from river level up to 1,500 meters (4,900 ft.) altitude. It has comparatively small, glabrous, crenate leaves, and small flowers with 2, rarely 3, styles. The fruit is about 1 to 1.4 centimeters (2/5 to 1/2 in.) in diameter. (Adapted from Plantae Wilsonianae, vol. 2, part 2, p. 264.)

For previous introduction and description see S. P. I. No. 45592, Plant Immigrant Bulletin No. 142, February, 1918, p. 1279.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, Wilson Popenoe, and H. L. Shantz, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, E. L. Crandall, L. G. Hoover, J. H. Johnson, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Seharunpur, India; Mr. E. W. D. Holway, Faribault, Minn; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla.; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Ar boretum, Jamaica Plain, Mass.; Dr. F. A. Woods, Boston, Mass.

PLANT IMMIGRANTS.

No. 161. SEPTEMBER, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acer	1479	Exocarpus	1482
Amerimnon	1479	Grewia	1483
Anacardium	1479	Lagerstroemia	1483
Arachis	1479	Metrosideros	1483
Arundinella	1480	Pavetta	1484
Barosma	1480, 1481	Phyllostachys	1485
Brassica	1481	Pieris	1484
Bucklandia	1481	Prunus	1484
Citrus	1482	Randia	1484
Dodonaea	1487	Selinum	1485
Engelhardtia	1482	Timonius	1485

Plates:

245. American-grown bamboo shoots, *Phyllostachys mitis.*
246. An interesting hedge plant from New Zealand, *Dodonaea viscosa.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by agricultural explorers and foreign correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued September 28, 1919, Washington, D.C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acer campbellii (Aceraceae), 47629. **Maple.** From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. This is the principal maple of the northeastern Himalayas, where it grows at an altitude of 7,000 feet and more. The leaves are a beautiful green with red petioles. The grayish white, close-grained wood is moderately hard and is extensively used for planking and for tea boxes. The tree reproduces freely by seed or by coppice, and plays an important part in the regeneration of the hill forests. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 1, p. 69.)

Amerimnon sissoo (Fabaceae), 47637. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. "The timber is very valuable, and is one of the numerous kinds which are known in the timber trade as rosewood. The heartwood is brownish, and it posseses great strength and elasticity. It is also heavy, its weight being about 50 lbs. to the cubic foot. The wood is used for all kinds of joinery and cabinet work, carving, building material, gun carriages, etc. It requires a tropical or subtropical temperature." (Gardeners' Chronicle, Jan. 31, 1914, p. 82, under *Dalbergia sissoo*.)

Anacardium excelsum (Anacardiaceae), 47929. From New York, N. Y. Seeds presented by H. P. Finlay & Co. Ltd. "Seeds, called 'mijagua,' that come from Venezuela, where they are used as a substitute for Indian corn in the feeding of hogs. These seeds are much cheaper than Indian corn in Venezuela." (Finlay.)

A majestic tree, related to the cashew nut, found at altitudes ranging from sea level to 2,700 feet in torrid regions. The wood is hard and heavy and worked with difficulty, but it is used in making boats and canoes. Fish are very fond of the fruit and it is stated that in ancient times the Indians in Talamanca used the cut-up bark of this tree to stupefy the fish and thereby to catch them more easily. (Adapted from Pittier, Plantas Usuales de Costa Rica, p. 92.)

For previous introduction and description see Plant Immigrant Bulletin No. 111-2, p. 904, S. P. I. No. 40987.

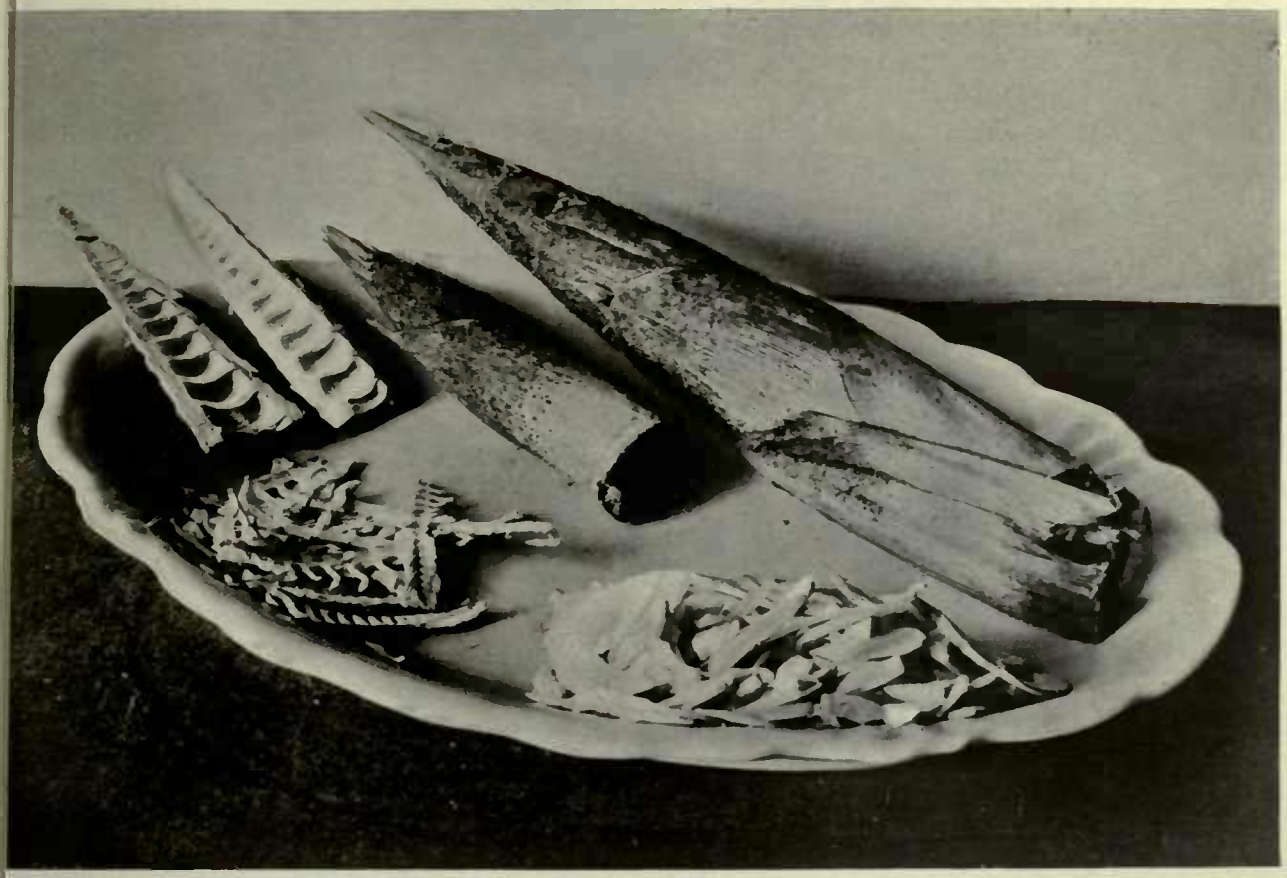
Arachis hypogaea (Fabaceae), 47865. **Peanut.** From Rio de Janeiro, Brazil. Seeds presented by Capt.

Amilcar A. B. Magalhães, Commissão de Linhas Telegraphicas Estrategicas de Matto Grosso ao Amazonas. Peanuts grown by Mr. R. G. Reidy on his property, 'Cascatinha,' 500 meters above sea level, at the station called Martins Costa, on the Central Railway of Brazil, state of Rio de Janeiro. The original seed, - from the wilds of Matto Grosso, where it was grown by the Indians, - was given to Mr. Reidy by the Commissão in 1918 and is understood to have been selected for its very large size. The specimens sent are reduced in size but are still much larger than the common peanut of Matto Grosso. Mr. Reidy stated that the development of the crop was retarded by damage resulting from floods. The product shows a marked modification in coloration. (Adapted from letter of Capt. Magalhães.)

For previous introduction and description see Plant Immigrant Bulletin No. 123, p. 1025, S. P. I. No. 43035.

Arundinella hispida (Poaceae), 47641. Grass. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A perennial grass, with a stout, hard, creeping rootstock, and with a simple or branched stem from 1 to 5 feet in length. The leaves are narrow or broad and from 6 to 12 inches long, and the panicles are 4 to 18 inches in length. This is an abundant grass throughout the hilly parts of India, and is distributed through the East Indies, South Africa, Australia, and tropical America. In São Paulo, Brazil, it is considered a good forage plant for dry lands. (Adapted from Correa, Flora do Brazil, p. 128; and Hooker, Flora of British India, vol. 7, pp. 73, 74.)

Barosma betulina (Rutaceae), 47953. From Burttholm, Vereeniging, Transvaal, South Africa. Seeds presented by Mr. J. Burtt-Davy. The "honey-buchu," a branching, evergreen shrub, - the best variety of buchu, - is found on South African mountain slopes in red, sandy loam, at altitudes between 1,000 and 2,000 feet. It is bushy and compact and reaches a height of 3 to 4 feet, though it may grow taller. On account of the starlike, purple flowers this plant compares favorably as an ornamental with the gardenia and camellia. The small, light green leaves are smooth and leathery and are covered on each surface with oil glands. A greenish yellow oil is extracted from the leaves, with alcohol or with boiling water. When exposed to the cold the



AMERICAN-GROWN BAMBOO SHOOTS. (PHYLLOSTACHYS MITIS, S. P. I. NO. 24759.)

"One of the highest priced vegetables in Japan and China is the young shoot of the bamboo just as it appears above ground. The shoot is clothed with many overlapping papery husks, like those of an ear of corn, and the tender inside portion is chambered. This latter is prepared for the table by cutting into thin slices and boiling, and when served with butter it forms a remarkably crisp, delicate vegetable. The shoots shown are from the cooperative plantation of Mr. E. A. McIlhenny, at Avery Island, La., which was planted in 1910. This is the second season that Mr. McIlhenny has gathered shoots and sent them to this office. According to Kozai, as nearly 70 per cent of the total nitrogenous matter in the bamboo shoots is in amid form, the determination of their food value from the modern standards of vitamines deserves to be made."—Fairchild. (Photographed by E. C. Crandall, April 26, 1916; P18488FS.)

AN INTERESTING HEDGE PLANT FROM NEW ZEALAND. DODONAEA VISCOSA. (SEE S. P. I. NO. 36813.)

The New Zealand Dodonaea is proving to be one of the best hedge plants for tropical and subtropical regions. It is beautifully dense and green, responds to the shears perfectly, and when taken in hand early makes a compact wall clear to the ground. Seedling plants form a deep taproot and must be transplanted with care on that account. (Photographed by Mr. Bisset on the ground of the Citrus Experiment Station at Riverside, Calif., October 22, 1916; P20609FS.)

oil deposits a solid barosma camphor which, when purified, has the odor of peppermint. The leaves contain the most oil in January or February but it is better to clip the twigs in early March, after most of the seeds have fallen. In clipping, care is taken to leave a sufficient number of buds for the next year's growth. Leaves of one year's growth are far superior to those two years old. They are astringent and contain a bitter substance which acts beneficially on the stomach. The Hottentots and Bushmen used a solution of the leaves for bladder and kidney complaints, and the roots for snake bites. (Adapted from The Agricultural Journal of the Union of South Africa, April, 1893, July and December, 1913.)

Barosma crenulata (Rutaceae), 47954. From Burttholm, Vereeniging, Transvaal, South Africa. Seeds presented by Mr. J. Burtt-Davy. The large-leaved buchu, — the kind most esteemed in the colony, although not the highest priced in London, — is often distinguished as the "true buchu." It is a twiggy shrub, 3 to 4 feet high with smooth purplish branchlets, and leaves 1 to 1½ inches long. The pale purplish flowers, produced in October and November, are very plentiful and last for a long time. The uses are the same as those of *B. betulina.* (Adapted from The Agricultural Journal of the Union of South Africa, April, 1893.)

Brassica besseriana (Brassicaceae), 47928. **Mustard.** From Aden, Arabia. Presented by Mr. Addison E. Southard, American consul. "Two kinds of mustard are grown in the Yaffai Dthala districts of the Aden hinterland; and in the Arabian Red Sea districts of Dubham, Shargah, Koraisha, Hojaria, and other places. These two kinds are known in Arabic as *khardal* (or *ghardal*) and *tartar.* The first-named variety yields but little oil while the latter yields proportionately a good deal of oil. The clerk in this consulate has been sent to canvass the Arab families in Aden and Sheikh Othman with whom he has acquaintance, and has succeeded in obtaining from the medicine chest of one old gentleman a few grams of the *khardal* (or *ghardal*) variety which are herewith enclosed." (Southard.)

Bucklandia populnea (Hamamelidaceae), 47649. From Darjeeling, India. A collection of seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A large

evergreen tree, up to 80 feet in height, native to the eastern Himalayas at altitudes of 3,000 to 8,000 feet. The wood is grayish brown, close grained, and durable, and is very much used in Darjeeling for planking and for doors and window frames. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 1, p. 545.)

Citrus sinensis (Rutaceae), 47931. **Sweet orange.** From Auckland, New Zealand. Plants presented by Mr. H. R. Wright. "'Dunning's Seedless' (navel orange). Seedling, from the Washington navel, raised in Queensland, Australia, where it is said to surpass the Washington navel (new)." (Wright.)

For previous introduction and description see Plant Immigrant Bulletin No. 124, p. 1034, S. P. I. No. 43147, and Inventory No. 37, Pl. 5.

Citrus webberii (Rutaceae), 47919. From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "*Mangapug.* The largest known, loose-skinned citrus fruit in the world. The fruit is citron-yellow, has 13 to 15 locules, very thin skin, and juicy flesh. The fruit is eaten by the natives in Cotabato. It is apparently a rare form for I saw no trees anywhere during my stay in Cotabato, where I went as far as Fort Pikit in the interior. Nowhere did I see any signs of canker though I was on the lookout for this disease." (Wester.)

Engelhardtia spicata (Juglandaceae), 47842. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A large, handsome tree belonging to the walnut family, native to the foothills of the eastern Himalayas. The thick, brown bark contains much tannin; the wood shows a beautiful grain and is said not to warp. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 3, p. 244.)

Exocarpus cupressiformis (Santalaceae), 47866. From Sydney, Australia. Seeds presented by Mr. J. H. Maiden, director, Botanic Gardens. "Native Cherry." A small tree, about 20 feet high, with very numerous, green, wiry branches sometimes collected in a dense, conical head, sometimes loose and pendulous at the ends. The leaves are reduced to tiny alternate scales. The flowers are small, in terminal spikes, and soon fall off, except one in each spike; after fertilization, this one is raised on an obconical pedicel which thickens to a

diameter of one-fourth of an inch and is red and succulent. The fleshy edible pedicel, under the small, dry, globular fruit, has been likened to a cherry with the stone outside. The close-grained, handsome wood is used for turning and cabinet purposes. (Adapted from Bentham, Flora Australiensis, vol. 6, p. 229, and Maiden, Useful Plants of Australia, pp. 30, 534.)

Grewia multiflora (Tiliaceae), 47689. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A shrub or small tree of eastern and western India, ascending to 4,000 feet. The white wood gives out an exceedingly unpleasant odor when cut, and is extensively used in making cot frames, ax handles, oar shafts, etc. The plant is also much used for making hedges, for which its close growth and evergreen leaves make it especially suitable. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 4, p. 179.)

Lagerstroemia parviflora (Lythraceae), 47703. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A large, deciduous tree met with in the sub-Himalayan tract in Bengal, Assam, central and southern India. The gum which exudes from the bark is said to be sweet and edible, and the bark yields a fiber used in the making of ropes. The bark is also used in dyeing skins black, and for tanning. The grayish brown wood is very hard and tough, seasons well, and is fairly durable. It is largely employed for agricultural implements, boats, buggy shafts, etc. It is one of the trees on which the tasar silkworm is fed. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 4, p. 584.)

Metrosideros tomentosa (Myrtaceae), 47930. From Auckland, New Zealand. Seeds presented by Mr. H. R. Wright. "*Pohutukawa*. One of the most beautiful of flowering trees, and very valuable as a bee plant; the honey made from these is of excellent flavor and is pure white. This tree, about 40 feet in height, is found on the hillsides, along the beach, and even grows out of the sides of the sea cliffs. In many cases, thriving trees grow above high water mark, where the roots are frequently washed by the tide. Like *M. robusta*, the hard wood is used for making knees for boat building. Strange to say, *M. tomentosa* is found in the wild state only near the sea, although it grows

well inland providing it is protected from frost." (Wright.)

For previous introduction and description see Plant Immigrant Bulletin No. 122, p. 1017, S. P. I. Nos. 42851, 42852.

Pavetta indica (Rubiaceae), 47749. Pawatia. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A very variable bush or small tree, common throughout most of India, ascending to 4,000 feet in Gárhwal. The powdered root is used as a laxative in native medicine, and the fruit, a two-seeded berry, is picked and eaten in Madras. The white flowers, which occur in broad flat corymbs, are said to be used as food by the hill people of Màtheràn. (Adapted from Watt, Dictionary of the Economic Poducts of India, vol. 6, p. 114; and Brandis, Forest Flora of India, p. 275.)

For notes on the interesting bacterial nodules of the leaves, see *Pavetta zimmermanniana*, S. P. I. Nos. 42767 and 45554, Plant Immigrant Bulletin Nos. 121 and 141, pp. 1003, and 1267 respectively.

Pieris ovalifolia (Ericaceae), 47755. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A shrub or small tree with ovate or somewhat oblong leathery leaves 3 to 6 inches long, and racemes of white or bluish, or sometimes flesh-colored flowers. Because of a poisonous principle the young leaves and buds are a useful insecticide. It is a native of the temperate parts of the Himalayas. (Adapted from Brandis, Forest Flora of India, p. 280; and Watt, Dictionary of the Economic Products of India, vol. 6, p. 22 9 .)

Prunus cerasifera myrobalana (Amygdalaceae), 47932. From Auckland, New Zealand. Plants presented by Mr. H. R. Wright. "'Coffee's Myrobalan.' This variety we use for the working of European plums and prunes (*Prunus domestica*). They grow well, and make a good union on it. It strikes almost as freely as a willow." (Wright.)

Randia uliginosa (Rubiaceae), 47769. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A small, deciduous tree of eastern, central, and southern India, with shining leaves and large, showy, white or cream-colored flowers. The succulent fruit is used in dyeing as an intensifier, and also in medicine as an astringent. Boiled

or roasted, it is often eaten by the natives as a vegetable. The leaves are boiled and eaten as greens. When unripe, the fruit is used to poison fish. (Adapted from Watt, Dictionary of the Economic Products of India, vol. 6, p. 391; and Brandis, Forest Flora of India, p. 273.)

For previous introduction and description see Plant Immigrant Bulletin No. 104, p. 838, S. P. I. No. 39655.

Selinum tenuifolium (Apiaceae), 47790. From Darjeeling, India. Seeds presented by Mr. G. H. Cave, director, Lloyd Botanic Garden. A highly ornamental Himalayan plant with very finely divided fernlike leaves. When the plant is isolated on a lawn and not allowed to flower the effect is very striking because of the fresh green color of the leaves. It is perfectly hardy in England. (Adapted from The Garden, vol. 38, p. 221.)

Timonius rumphii (Rubiaceae), 47867. From Sydney, Australia. Seeds presented by Mr. J. H. Maiden, director, Botanic Gardens. A tall shrub or small tree, with small drupes which have much the appearance of the wild crab apple of Europe. The wood is light in color, close grained, and suitable for lining boards; it is easily worked and resembles somewhat the English sycamore. (Adapted from Maiden, Useful Native Plants of Australia, pp. 63, 607.)

Notes on Behavior of Previous Introductions.

Phyllostachys pubescens (Poaceae), S. P. I. No. 24759, shown as *P. mitis* in Plate No. 245 of this issue, is the great edible bamboo of China and Japan, and the largest of the hardy species. The culms attain a maximum height of 80 feet and a maximum diameter of 8 inches.

Bamboo groves in America are just beginning to produce shoots in sufficient quantity to make experimental cooking tests possible. Shoots were sent to this Office, May 5, 1919, from the Barbour Lathrop Bamboo Grove, near Savannah, Ga. The shoots were stripped of all tough coverings of husk, and the hard base removed, leaving only the tender parts; they were then cut into cross-sections one-eighth of an inch thick, boiled in salted water for 2½ hours, drained, and served with butter sauce. The deliciously rich but

delicate flavor, the tender crispness, and the pleasant aroma of the cooked shoots, make this one of the most appetizing and keenly relished of dishes.

It may be interesting to those growing oriental bamboo to know that in 1917 bamboo shoots were exported from the Island of Formosa to places other than the Empire of Japan to the amount of 563,397 kin (751,196 lbs.). These were exported principally to China. While edible bamboo shoots are used both fresh and canned, they are also dried. This office has not yet had opportunity, however, to experiment with the dried product. The following statement in regard to dried bamboo shoots was received May 24, 1919, from Mr. G. Takata, director, Department of Productive Industries, Government of Formosa.

Method of Preparing Dried Bamboo Shoots.

"In the months of June and July, bamboo shoots or 'Asa take,' as they are locally called, are collected as they grow up to the length of 3 or 4 feet; and the tough portion of their bases and the soft portion of their upper parts are removed. Then the bamboo shoots are peeled off, cut into slender shreds [thin slices?] measuring 3 inches long and 2 inches thick [wide?] and then they are boiled in iron pans and when they are adequately boiled, they are put into a large barrel with the boiled water removed. These shreds [slices] are placed under moderate weight for usually two weeks so that the water contained therein is completely forced out. Finally they are dried in the sun until they are ready for eating. At the time of boiling the bamboos or putting them into a barrel, no kind of medicine [preservative?] or seasoning is added. Sliced and cut bamboo shoots mean bamboos that are cut into finer threads [narrower slices?] measuring 2 or 3 inches long. Sliced bamboo shoots are in the same manner prepared of the upper part only of the bamboo shoots.

Method of Dressing Dried Bamboo Shoots.

"Dried bamboo shoots taste bitter and emit some smell and have, therefore, to be adequately seasoned after they have been thoroughly boiled in hot water. Usually dried bamboo shoots are throughly boiled with lard or prepared with vegetables, mushrooms, etc., in salted broth.

Method of Discriminating Fresh from Old Bamboos and Good from Bad Ones.

"Fresh bamboo shoots are much stronger in yellow color than old ones, and new ones impart stronger smell. Fresh ones, after they are boiled, obtain much stronger bitterness and astringency; old ones emit whitish powder and get considerably deprived of yellow color. Fresh ones are distinctly yellow, and soft and pleasant to the touch.

"Bamboo shoots of superior quality are obtainable only from those of the earliest season."

Dodonaea viscosa (Sapindaceae), S. P. I. No. 36813, illustrated by Plate No. 246 of this Bulletin, was introduced from New Zealand, by the Department of Agriculture, in February, 1905. There have been subsequent introductions, from the Sudan, the Philippines, and Australia. Fourteen hundred plants, under the above introduction number, were distributed in 1915, from the Yarrow Plant Introduction Field Station, near Rockville, Md., to experimenters living in Florida, California, Texas, New Mexico, Alabama, and Porto Rico. The following year reports were recieved on about 700 of these plants; only 245 of them were then living. Nearly all of the plants which were well established survived light frosts the first winter, and although the tips of the foliage were browned by a temperature of 28°F., the plants soon recovered. The plants did equally well on bottom land and upland. In spite of the large loss of plants the first year, this species gives promise of distinct value for hedge use in the southern parts of California and Florida.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, Wilson Popenoe, and H. L. Shantz, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, E. L. Crandall, L. G. Hoover, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Seharunpur, India; Mr. E. W. D. Holway, Faribault, Minn; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla.; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum, Jamaica Plain, Mass.; Dr. F. A. Woods, Boston, Mass.

PLANT IMMIGRANTS.

No. 162. OCTOBER, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Achradelpha	1491	Eugenia	1494
Agathosma	1491	Manihot	1494
Aleurites	1491	Ocotea	1494
Amygdalus	1492, 1496	Oenocarpus	1494
Anaxagorea	1492	Olearia	1495
Bauhinia	1492	Parkia	1495
Casimiroa	1493	Parthenium	1495
Cassia	1493	Solanum	1495, 1496
Cucumis	1493	Virola	1496

Plates:

247. Tropical Combretum recovering from the freeze in Florida, *Combretum comosum.*

248. The Brazilian grumichama after the heavy freeze at Buena Vista, Fla. *Eugenia dombeyi.*

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by agricultural explorers and foreign correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued October 20, 1919, Washington, D.C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Achradelpha mammosa (Sapotaceae), 47956. **Sapote.** From San José, Costa Rica. Presented by Mr. Carlos Wercklé, through Mr. José C. Zeledon. "Few other fruits are of such importance to the natives of Mexico and Guatemala as the **sapote**, which grows wild in the forests of Guatemala, Tabasco, and Chiapas. It is often cultivated, but much of the fruit consumed in these regions is gathered from wild trees. Elsewhere in tropical America it is planted in gardens, notably in Cuba where it is a favorite fruit. The Central American common name, 'zapote' (spelled sapote in English), is taken from the Aztec 'tzapotl,' a generic name applied by the ancient Mexicans to all soft, sweet fruits. In Cuba it is called 'mamey sapote' and 'mamey colorado.' The sapote is a large tree, sometimes attaining 80 or 90 feet in height. It thrives only in regions where the climate is warm and rather moist; it can not stand the cold winters of California, and for some reason it has not succeeded in southeastern Florida, although it is apparently not the cold that interferes with its growth in the latter region. The fruits are the size of small muskmelons, but elliptic in form; they have a rough, russet-brown outer covering about an eighth of an inch thick; soft, melting, salmon-colored or reddish flesh, sweet, and of rich flavor; and a single large, elliptic, glossy brown seed. A poor **sapote** resembles a squash in taste, but a good one has a rich and pleasant flavor. The fruit is eaten fresh, made into jam, or frozen to form a sherbet." (Popenoe.)

For previous introduction and description see S. P. I. No. 39357, Plant Immigrant Bulletin, No. 102, October, 1914, p. 817.

Agathosma chortophila (Rutaceae), 47952. From Burttholm, Vereeniging, Transvaal, South Africa. Seeds presented by Mr. J. Burtt-Davy. "Leaves of various species of Agathosma, of the Cape region, are used like buchu, [the source of barosma camphor], but are of a more delicate and agreeable odor." (National Standard Dispensatory, 1905, p. 1335.)

For fuller discussion of buchu see pp. 1480, 1481, of the previous number (161) of the Plant Immigrants.

Aleurites trisperma (Euphorbiaceae), 47942. **Banucalag.** From Mayaguez, Porto Rico. Seeds presented by Mr. W. D. May, Porto Rico Experiment Station. "You sent us, in 1909, seed of *A. trisperma*, under S. P. I. No. 26050.

This introduction is producing more seed than *A. fordii* or *A. moluccana,* and I am sending you a bag of it. It grows well with us and the seed is easily gathered." (May.)

"This is a strictly tropical species of very limited distribution, and is reported to fruit rather irregularly and less prolifically than the true lumbang, *A. moluccana,* the more common, hard-shelled species. The shell of the seed is much thinner and more easily broken than that of the common lumbang, and the oil obtained from the kernel is said to be very similar in drying properties to that of *A. fordii,* the tung-oil tree of China." (R. A. Young.)

For previous introduction and distribution, see S. P. I. No. 44061, Plant Immigrant Bulletin, No. 129, January, 1917, p. 1107.

Amygdalus davidiana (Amygdalaceae), 47949. From Dundee, Ill. Presented by the D. Hill Nursery Co., who purchased them from the Yokohama Nursery Co., Yokohama, Japan. Seeds of the davidiana peach, part of a shipment secured for stock purposes. The Yokohama Nursery Co. presumably obtained the seeds from China. So far as the Department is informed, this is the first commercial introduction of davidiana peach pits into the United States.

For previous introduction and description see Plate No. 194, Plant Immigrant Bulletin, No. 121, May, 1916.

Anaxagorea brevipes (Annonaceae), 47959. From Georgetown, Demerara, British Guiana. Presented by Mr. J. B. Harrison, director, Science and Agriculture Department, Botanic Gardens. "Black Yarri-yarri." A tree with yellow, medium hard wood which is used for fishing rods. (Adapted from Journal of the Board of Agriculture of British Guiana, July, 1918, vol. 11, p. 99.)

Bauhinia sp. (Caesalpiniaceae), 47940. Plants growing at the Yarrow Plant Introduction Field Station, Rockville, Md., from seeds collected by Dr. J. N. Rose, associate curator, National Herbarium. "No. 22119. August, 1918. This plant was very common on the dry hills above Huigra, Ecuador, associated with Cacti, Fourcroya, and other semi-arid plants. It forms a small round bush about 3 or 4 feet high with the characteristic two-lobed leaf of the Bauhinia. The

flowers are borne in small clusters of fours or fives and suggest, in a way, small red-flowered fuchsias. The calyx is cut on one side and is pushed off the petals like a spathe. The petals which are nearly an inch long are spread only a little at the tip and at first suggest a tubular flower. The plant was seen nowhere else although it was quite common at Huigra at an altitude of about 4,000 feet. The flowers are so attractive that we believe it might prove a valuable addition to our ornamentals, especially in the semi-arid region of the southwestern United States." (Rose.)

Casimiroa sp. (Rutaceae), 47957. From Los Angeles, Calif. Budwood presented by Mr. Milo Baker. "Budwood from a tree grown from a cutting received from Central America some years ago and budded into a white sapote tree. This budded tree is fruiting this year for the second time. The fruit is practically seedless and about the size of a small apple; the entire fruit is edible, and very rich. The tree seems to be a vigorous grower and a prolific fruiter." (Baker.)

The cuttings received are more pubescent than those of the common *C. edulis* (the white sapote), and I suspect they belong to one of the other species of this genus,- probably *C. sapote* or *C. tetrameria*. It is not rare for the white sapote to produce seedless fruits and, so far as I know, the other species of Casimiroa produce fruits much like those of the white sapote in character." (Popenoe.)

Cassia angustifolia (Caesalpiniaceae), 47974. **Senna.** From Tangier, Morocco. Seeds presented by Mr. J. Goffart. This plant is one of the sources of the drug known as senna. It is grown extensively in India and Arabia. Watt, in his Commercial products of India, says of its culture: "It is sown on red or black clay loams, fairly liberally plowed and manured, the sowing being in May. Weeding has to be attended to, but irrigation is hardly, if ever, necessary. The season for collecting the leaves is June to December."

Cucumis melo (Cucurbitaceae), 47946. **Muskmelon.** From Fresno, Calif. Presented by Mr. A. C. Jewett. "No. 1. A variety of Afghan melon which matures very late in the fall. It is very superior to the common run of melons." (Jewett.)

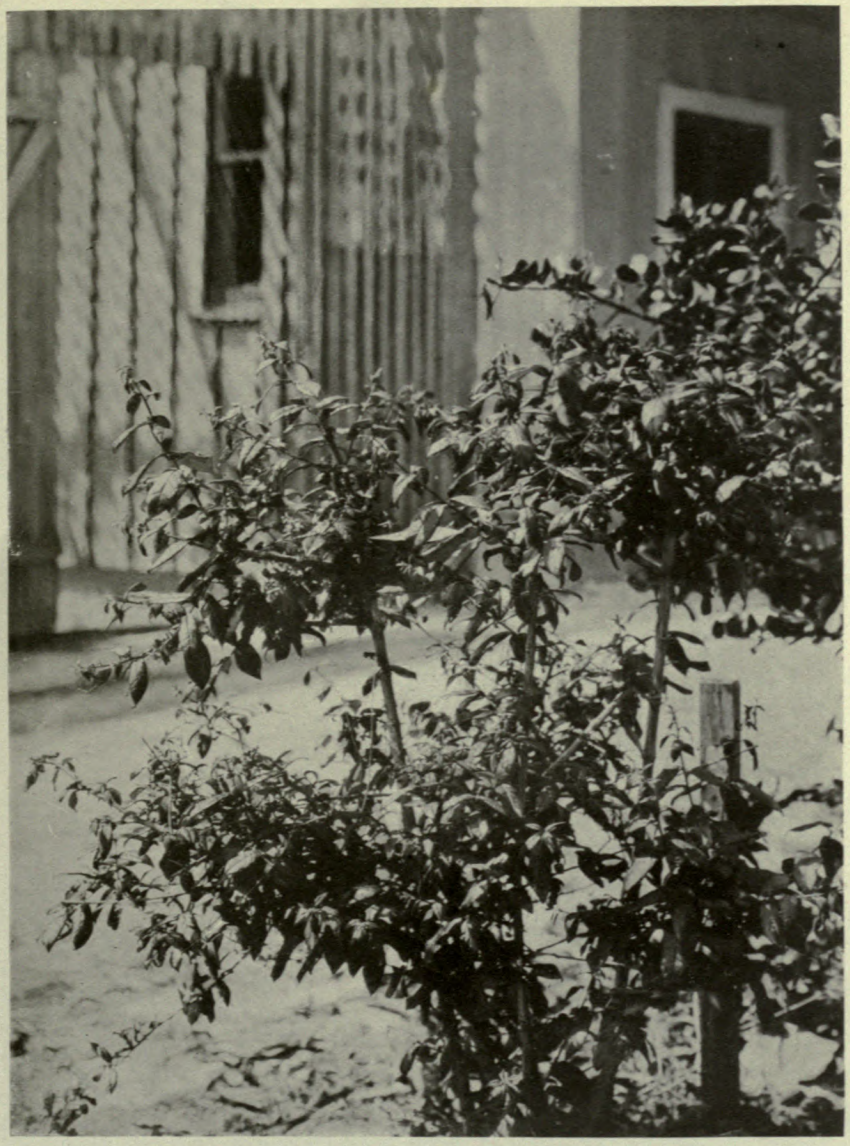
For previous introduction and description, see S. P. I. No. 46029, Plant Immigrant Bulletin No. 146, June, 1918, p. 1327.

Eugenia sp. (Myrtaceae), 47970. From Puerto Bertoni, Paraguay. Seeds presented by Dr. Moises S. Bertoni. "Native name in Guarani, 'Anyangapirihapuá,' A species with round cherry-colored fruit; a low shrub, very resistant to cold; fruit good." (Bertoni.) See Plate 248.

Manihot tweedieana (Euphorbiaceae), 47971. From Puerto Bertoni, Paraguay. Seeds presented by Dr. Moises S. Bertoni. "Native name in Guarani, 'Gwasú-mandió.' The Indians claim that by subjecting this species to annual cultivation, in a few years they obtain an edible variety." (Bertoni.)

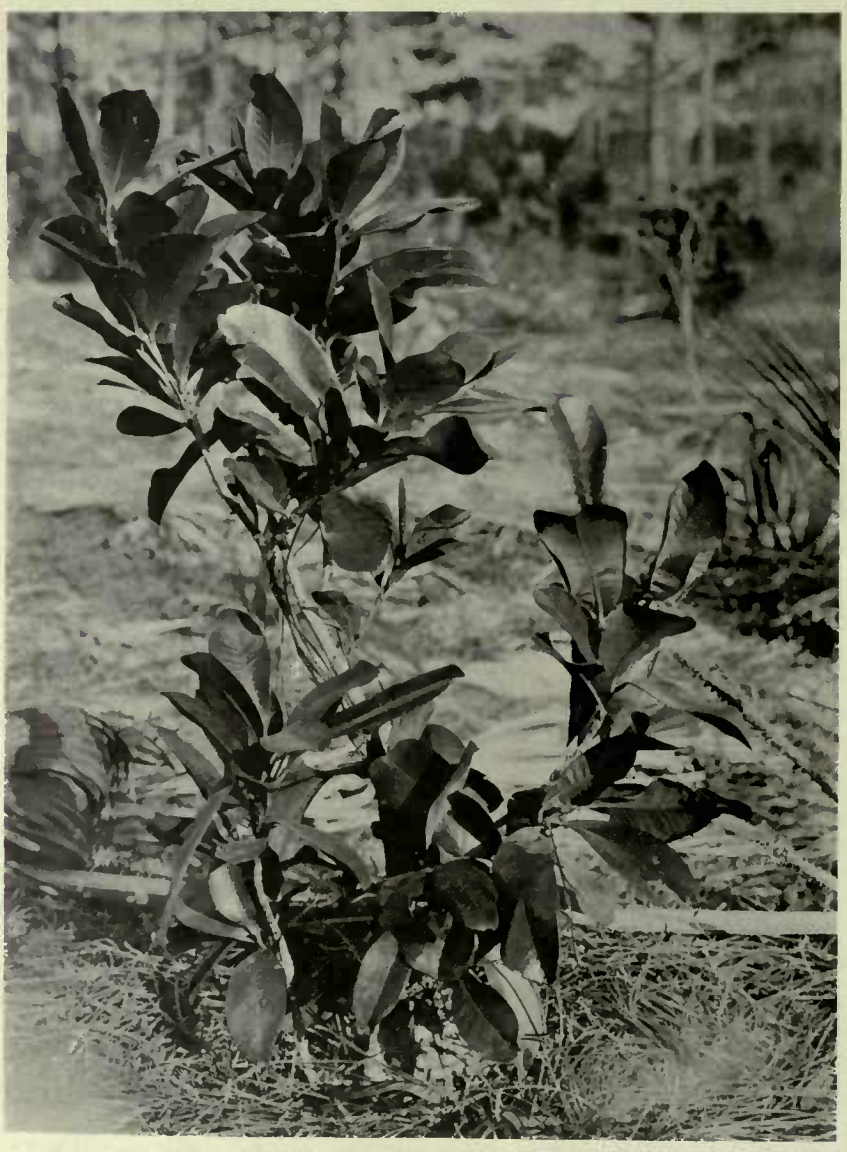
Ocotea rodiei (Lauraceae), 47962. From Georgetown, Demerara, British Guiana. Presented by Mr. J. B. Harrison, director, Science and Agriculture Department, Botanic Gardens. "Bibiru, Greenheart." A well-known tree which grows to a large size. The wood is used for wharf piles, in shipbuilding, and in other constructional work. (Adapted from Journal of the Board of Agriculture of British Guiana, July, 1918, vol. 11, p. 106.)

Oenocarpus bataua (Phoenicaceae), 47965. **Palm.** From Belem, Parà, Brazil. Presented by Dr. J. Simão da Costa. A tall, majestic tree with a large, smooth trunk generally distinctly ringed; the leaves are terminal, pinnatisect, with linear segments; the spadices spring from beneath the leaves, and are simply branched; the spathe is large, fusiform, and woody, and falls off as soon as the spadix escapes from it; the flowers are monoecious, and the fruit is nearly globular, one seeded, and the flesh is edible. All species of this genus afford oil and "yukissé" (palm-drink) from the fruits and they are also used for various other purposes. The leaves serve as a thatch, and from the nerves of the decayed petioles the Indians make arrows for their blowpipes. The oil is colorless and sweet, and not only excellent for lamps but also for cooking. The shopkeepers of Pará buy these oils from the Indians, and mix them in equal proportions with olive oil retailing the whole as olive oil from which even the



TROPICAL COMBRETUM RECOVERING FROM THE FREEZE IN FLORIDA. (COMBRETUM COMOSUM. SEE S. P. I. NO. 28288.)

This extremely ornamental flowering shrub in its native home, Mauritius, is never subjected to frost. Its behavior in Miami, Fla., under a temperature of 26.5° F. was remarkable. Its leaves, normally bright green, turned ashen gray within 48 hours, and it was apparently quite dead, but in a month's time it had sent out the new shoots shown in this illustration. Resistance to frost is shown in a variety of ways by strictly tropical vegetation. (Photographed by Mr. David Fairchild at Miami, Fla., March 9, 1917; P20475FS.)



THE BRAZILIAN GRUMICHAMA AFTER THE HEAVY FREEZE AT BUENA VISTA, FLA. (EUGENIA DOMBEYI. SEE S. P. I. NO. 37836.)

Brought from the Bahian region of southern Brazil by Dorsett and Popenoe, where the jaboticaba is at home, and withstanding a temperature of 26° F., this Brazilian fruit tree promises to be a success in southern Florida. Its agreeable fruits, combined with its hardiness, entitle it to a wide trial. (Photographed by Mr. David Fairchild at Buena Vista, Fla., February 3, 1917; P20396FS.)

best judges can scarcely distinguish it. For frying fish this oil is equal either to olive oil or butter. The tree is native to the Amazon valley, at an altitude of not more than 1,600 feet above sea level. (Adapted from Seemann, Popular History of the Palms, p. 270.)

Olearia furfuracea (Asteraceae), 47958. From Avondale, Auckland, New Zealand. Seeds presented by Mr. H. R. Wright. A freely branching ornamental shrub or small tree, 6 to 20 feet high, native to the North Island of New Zealand. The alternate leaves, 2 to 4 inches long by 1 to 2 inches broad, vary in shape from oblong to broadly ovate. They are coriaceous, green above, and clothed below with a dense silvery tomentum. The small heads of white flowers are borne in large, much-branched corymbs on long slender peduncles. (Adapted from Cheeseman, Manual of the New Zealand Flora, p. 284.)

Parkia timoriana (Mimosaceae), 47948. **Cupang.** From Zamboanga, P. I. Seeds presented by Mr. P. J. Wester, agricultural advisor. "A handsome timber tree, the seeds of which are roasted and used for coffee." (Wester.)

It is a rapid-growing tree, reaching a maximum height of 120 feet. It bears feathery bipinnate leaves and small white flowers in dense pear-shaped heads. The long, black, pendulous pods are over a foot long and are relished by cattle. The soft white wood is used for making matches.

Parthenium argentatum (Asteraceae), 47955. **Guayule.** From Saltillo, Mexico. Seeds presented by the Cia. Explotadora de Caucho Mexicano, through the American consul, Mr. H. C. Morgan. "Seeds from the **guayule** plant which yields a certain kind of commercial rubber. The seeds were collected from this year's flowers." (Morgan.)

Solanum chacoense (Solanaceae), 47972. **Potato.** From Puerto Bertoni, Paraguay. Seeds presented by Dr. Moises S. Bertoni. "The tubers, thicker than those of *S. commersonii,* have a strong flavor and are not usually eaten. But, under cultivation, there appear at times edible tubers (with a potato flavor); this happens sometimes in the wild state, but as an unstable variation, according to my results. It is a plant worth studying, especially by crossing with the common potato, for in this region it is not attacked by any

disease or insect; it produces two or three times a year, and thrives in dry and rather poor soils, where the common potato is not resistant." (Bertoni.)

Solanum quitoense (Solanaceae), 47951. **Naranjilla.** From Guayaquil, Ecuador. Seeds presented by Dr. H. R. Carter, assistant surgeon general, U. S. Marine Hospital, Baltimore, Md., who secured them from Dr. M. E. Connor, Guayaquil. "The fruit of the **naranjilla** is about the size of a mandarin orange; it is orange-yellow, but not flattened as much as the mandarin. The interior resembles that of a tomato or eggplant. I was told by Mr. Elizade, secretary of state of Ecuador, that it grew in the warm countries near Quito, i. e., at a lower altitude, and I feel reasonably sure that I saw a growing plant in the barren country on the upper Magdalena near Giradot, Colombia, but having no opportunity to examine it I am not positive. This plant resembled a large eggplant 4 to 5 feet high and was covered with fruit, some yellow and some green. I am told, by the same man, that it fruits when young, i. e., the first season, and from what I heard I thought it might do so from Thomasville, Georgia southward, and in southern California. The fruit, which ripens in July, is too acid to be eaten out of hand, although I liked it, but it is used as a flavor for frescos (soft drinks) and ice cream." (Carter.)

For previous introduction and description, see S. P. I. No. 42034, Plant Immigrant Bulletin, No. 118, February, 1916, p. 968.

Virola sebifera (Myristicaceae), 47966. **Ucuuba.** From Belem, Pará, Brazil. Presented by Dr. J. Simão da Costa. A tree inhabiting the lowlands of the lower Amazon which produces in June and July a fruit about the size of a cherry with a brown paper-thin shell. This fruit contains an abundance of oil and stearin and, since each tree produces about 2 barrels of nuts a week during the fruiting season, this seems to be a promising source of soap material. The timber also is valuable, being hard and dense, and reddish brown in color, almost like mahogany. (Adapted from Lange, Lower Amazon, pp. 34, 407, 467.)

Notes on Behavior of Previous Introductions.

The following letter was received January 31,

1918, from Mr. L. A. Walton, Yuba City, California:

"I have received some of the *Amygdalus davidiana* (S. P. I. No. 34515) Chinese peach seedlings from the Chico Plant Introduction Garden each year for the past four years. I received the first shipment, about 50 trees, in February, 1915, and planted them all in alkali ground in different parts of my orchard where I had not been successful in growing other varieties of trees. All of the *A. davidiana* that had made a good strong growth in the nursery made a wonderful growth after being transplanted. I budded these trees to the Walton Cling in September, 1915. They are very thrifty, fine looking trees now, much larger than any other trees of the same age, that I have in my orchard, and I picked a good crop of peaches from these trees last summer. I have planted some of the *A. davidiana* on high, sandy loam with a clay subsoil and some on very fertile, river- ottom soil. In each case they have made a strong growth and I believe it is the best root stock that we can use for our commercial orchards. I might add that all of our orchards in Sutter County are irrigated from wells so the trees have plenty of moisture during the summer months. If we could get the pits from this seedling for some of our best nurseries I am quite sure that we would have much stronger trees than we are growing at the present time, and on soil that is not too strong with alkali they will grow very successfully."

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, Wilson Popenoe, and H. L. Shantz, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, E. L. Crandall, L. G. Hoover, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Seharunpur, India; Mr. E. W. D. Holway, Faribault, Minn.; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla.; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum. Jamaica Plain, Mass.; Dr. F. A. Woods, Boston, Mass.

PLANT IMMIGRANTS.

No. 163. NOVEMBER, 1919.

GENERA REPRESENTED IN THIS NUMBER.

	Page		Page
Acacia 1501, 1502,	1503	Mimusops	1505
Astrocaryum	1504	Myrica	1506
Berberis	1504	Phaseolus	1506
Beta	1504	Prioria	1506
Chayota	1507	Rheum	1506
Elaeis	1505	Saccharum	1507
Juglans	1505		

Plates:

249. A smooth form of the chayote. (*Chayota edulis.*)
250. A basketful of choice Guatemalan chayotes. (*Chayota edulis.*)

Foreign Seed and Plant Introduction.

EXPLANATORY NOTE.

This multigraphed circular is made up of descriptive notes furnished mainly by agricultural explorers and foreign correspondents relative to the more important introduced plants which have recently arrived at the Office of Foreign Seed and Plant Introduction of the Bureau of Plant Industry of the Department of Agriculture, together with accounts of the behavior in America of previous introductions. Descriptions appearing here are revised and published later in the INVENTORY OF PLANTS IMPORTED.

Applications for material listed in these pages may be made at any time to this Office. As they are received they are placed on file, and when the material is ready for the use of experimenters it is sent to those on the list of applicants who can show that they are prepared to care for it as well as to others selected because of their special fitness to experiment with the particular plants imported. Do not wait for the annual catalogue entitled NEW PLANT INTRODUCTIONS which will be sent you in the autumn and in which will be listed all plants available at that time. Regular requests checked off on the check list sent out with the catalogue are not kept over from year to year. If you are especially interested in some particular plant in the catalogue write and explain in detail your fitness to handle it.

One of the main objects of the Office of Foreign Seed and Plant Introduction is to secure material for plant experimenters, and it will undertake as far as possible to fill any specific requests for foreign seeds or plants from plant breeders and others interested.

David Fairchild,
Agricultural Explorer in Charge

Office of Foreign Seed and Plant Introduction,
Bureau of Plant Industry,
U. S. Department of Agriculture.

Issued November 1, 1919, Washington, D. C.

Anyone desiring to republish any portion of this circular should obtain permission by applying to this Office.

Acacia armata (Mimosaceae), 48035. **Kangaroo thorn.** From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. This simple-leaved, prickly acacia has a shrubby stem, 10 to 20 feet high, with graceful branches which are leafy to the tip. The long stamens give a soft fluffy appearance to the heads of opened flowers, which are borne on axillary peduncles longer than the leaves. This plant is much grown for hedges, though less manageable than various other hedge-plants and not so fire proof; it is more important for covering coast sand with an unapproachable prickly vegetation. The wood is small, but beautifully grained, sound and durable. Native in southern Australia. (Adapted from Maiden, Useful Native Plants of Australia, p. 349; and Curtis's Botanical Magazine, pl. 1653.)

Acacia cyanophylla (Mimosaceae), 48040. **Blue-leaved wattle.** From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. A handsome shrub from western Australia, 18 feet in height, with drooping branches and glabrous, lanceolate phyllodia; the lower ones are 1 foot, the upper, 6 inches in length. The numerous, large, golden yellow flowers are grouped in heads of 3 to 5 on short racemes. The pods are long and narrow. (Adapted from Bentham, Flora Australiensis, vol. 2, p. 364.)

Acacia elongata (Mimosaceae), 48042. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. This slender curved-leaved acacia is a graceful species abundant on the Blue Mountains of New South Wales. It has drooping, angular branches, and the younger ones are green and glabrous. The phyllodia are long and linear and bear clusters of peduncled, globose heads of yellow flowers in their axils. These clusters, which so profusely cover the leafy branches, even to the tips, make this a remarkably ornamental plant. It is especially suitable for damp sandy land. (Adapted from Curtis's Botanical Magazine, pl. 3337.)

Acacia homalophylla (Mimosaceae), 48045. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. A small tree, abundant on the barren heaths of the interior of New South Wales where it is one of the "spear-woods" of the natives. In Victoria, it grows on the saltbush

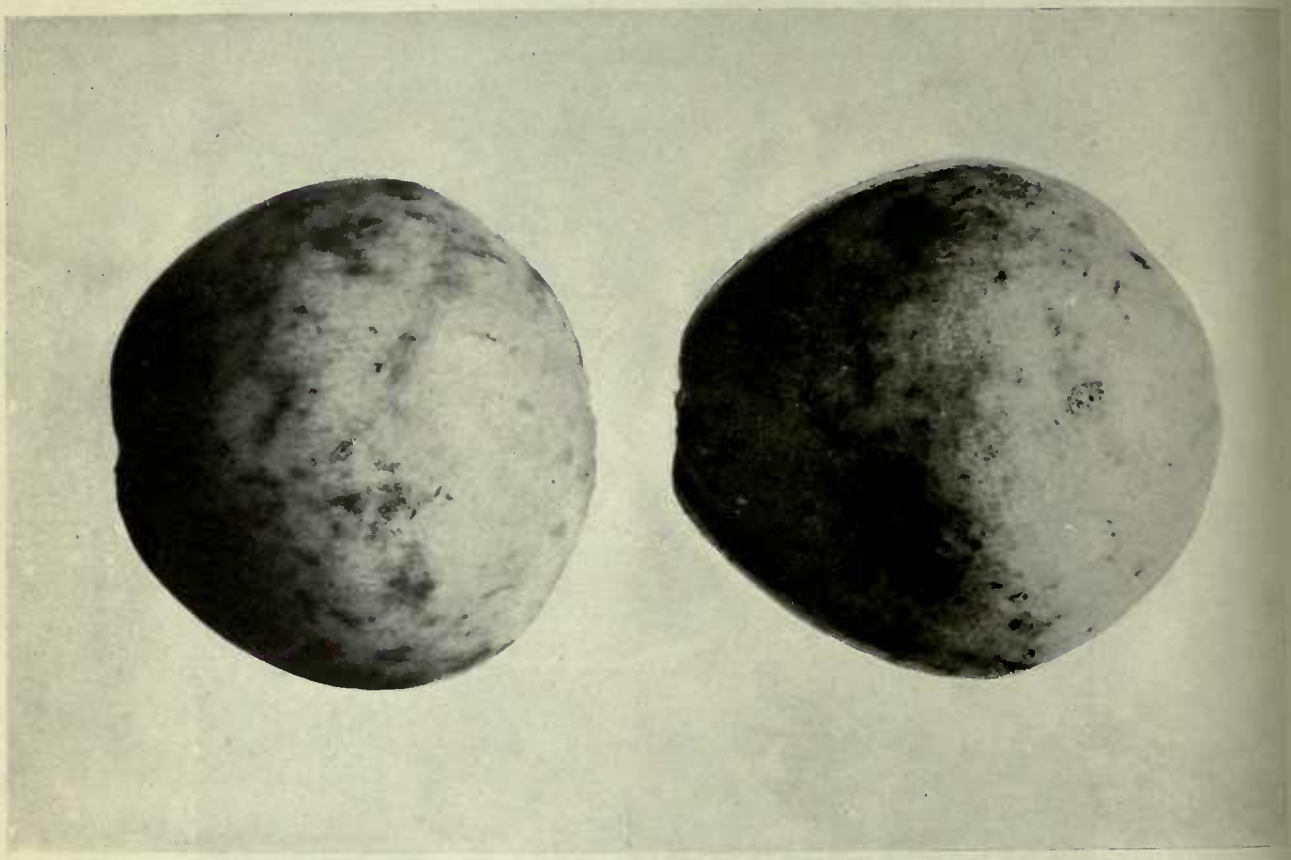
flats and yields the close-grained, prettily marked "Myallwood." The gum is eaten; and the hard, heavy wood is used for boomerangs. On account of its solidity and fragrance, this dark brown wood is much sought after for turners' work; perhaps its most extensive use is in the manufacture of tobacco pipes. It is well adapted for cabinet-making purposes, and fancy articles, such as rulers and napkin rings, are often made from it. It will grow in the bleakest and most arid localities wherever frost is not severe. (Adapted from Maiden, Useful Native Plants of Australia, p. 357; Mueller, Select Extra-Tropical Plants, p. 6; and Bailey, Queensland Flora, pt. 2, p. 495.)

Acacia longifolia (Mimosaceae), 48049. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. An evergreen acacia from New South Wales, with a branching, ashy brown trunk, 20 to 30 feet high. The axillary flower spikes are shorter than the leaves and are so entirely covered with sessile, citron-yellow flowers that they resemble catkins. The faint odor of the flowers is similar to that of peach blossoms. This is a valuable ornamental and a good shade tree for narrow streets. The bark is used as a tan for light leathers. The rapid-growing tree renders important service in subduing loose coast sand, the lower branches striking root into the soil; it should be disseminated on extensively bare sand shores in regions where no severe frosts occur. The timber is light, tough, hard, and durable, and is used for tool handles, etc. (Adapted from Maund's Botanist, vol. 2, pl. 77; and Mueller, Select Extra-Tropical Plants, p. 7.)

Acacia melanoxylon (Mimosaceae), 48051. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. An Australian hardwooded tree, attaining a height of 100 feet, though of slow growth; it sometimes flowers when under 20 feet in height. The lanceolate phyllodia, 3 to 4 inches long, are leathery and evergreen. The elongated flat pod is often curved into a circle; and the orbicular seeds, each encircled by double folds of a long dilated scarlet funicle, hang on the tree for months, making this pyramidal acacia a beautiful street tree. The mature wood, which is very dark, makes an excellent substitute for black walnut for furniture and grill-work, and is considered by some to be the most

A BASKETFUL OF CHOICE GUATEMALAN CHAYOTES. (CHAYOTA EDULIS, SEE S. P. I. NO. 43394.)

The chayote, or guisquil, is a favorite vegetable among the Guatemalans, being grown everywhere on large trellises. These large, smooth, green guisquils weigh a pound each and average 5½ inches long. The rich green surface is nearly free from corrugations and entirely without prickles. It is one of the best Guatemalan varieties. (Photographed by Wilson Popenoe at the city of Guatemala, Guatemala, December 2, 1917; P17461FS.) (See Plant Immigrants No. 132 for an illustration of a chayote arbor.)



A SMOOTH FORM OF THE CHAYOTE. (CHAYOTA EDULIS, SEE S. P. I. NO. 43422.)

This remarkable variety, without the corrugations so characteristic of the usual forms of the chayote, was introduced by Mr. Wilson Popenoe from Guatemala. The attractive appearance and excellent quality of this smooth, white "guisquil perulero," as it is called by the Guatemalans, make it one of the best forms found in Central America. (Photographed by Wilson Popenoe at Guatemala City, Guatemala, October 4, 1916; P16837FS.)

valuable of all Australian timbers. It is celebrated for its hardness and durability and is much valued for boat-building, bridges, railroad carriages, tool handles, etc. The figured wood is cut into veneers. It is an excellent wood for bending under steam, and is largely used for oil casks. As a fuel, it is equal to hickory. (Adapted from Maiden, Useful Native Plants of Australia, p. 359; and Bentham, Flora Australiensis, vol. 2, p. 388.)

Acacia pycnantha (Mimosaceae), 48058. **Golden wattle.** From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. A small, rapid-growing tree, with coriaceous leaves (phyllodia) and masses of fragrant, bright yellow flowers. The tree is second only to *A. mollissima* in yielding tanners' bark. The bark is often superior in quality to that of the Black Wattle, but is thinner and less in quantity, as the tree is smaller, reaching its maximum height at 30 feet. It exudes an abundance of gum, useful in cotton-printing. Perfume is made from the flowers and an aqueous infusion of the bark is used to preserve ropes, nets, and fishing lines. The wood is pale and easily worked and is used for staves, tool handles, etc. The plant is useful as a sand binder. (Adapted from Maiden, Useful Native Plants of Australia, p. 364; and Mueller, Select Extra-Tropical Plants, p. 12.)

For previous introduction and description, see S. P. I. No. 45867, Plant Immigrants, No. 144, April, 1918, p. 1305.

Acacia riceana (Mimosaceae), 48060. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. A Tasmanian shrub, in general appearance much like *A. verticillata*, 3 to 4 feet high, with elongated and gracefully drooping branches. The surface of the dark green awl-shaped leaves is covered with minute dots. The pale citron-colored flowers, on yellow peduncles and bearing many long exserted stamens, are in fluffy globular heads. The spikes are well down the stem from the tip and glimpses of the brown stalk between the daintily poised clusters remind one of Japanese art. (Adapted from Maund's Botanist, vol. 3, No. 135.)

Acacia senegal (Mimosaceae), 48064. From Tangier, Morocco. Seeds presented by M. Jules Goffart, Société d'Horticulture de Tanger. A tree widely distributed in tropical Africa and cultivated in India. It has

pinnate leaves and long, dense, clublike racemes of tiny flowers bristling with long stamens. This plant yields the true "gum arabic" of commerce, which is used for giving luster to crepe and silk, for thickening colors and mordants in calico-printing, in the manufacture of ink and blacking, as a mucilage, and for confectionery and medicinal purposes. It is more abundant in the dry season, exuding usually at the forking of the branches. In Kordofan, the gum is obtained from both wild and cultivated trees, and in the gardens the trees are artificially cut, strips of the outer bark being removed, shortly after the rains cease; the first collection of gum is made about 60 days after cutting and the garden is completely picked over every fourth day thereafter until the rains begin again and new leaves appear, at which stage the exudation ceases. The period of production is given at from 3 to 20 years, beginning when the trees are 3 or 4 years old. A plantation of about 10 acres has been estimated to yield from 1,200 to 1,500 pounds of gum in the course of a season. (Adapted from Holland, Useful Plants of Nigeria, pt. 2, p. 293; and Engler and Prantl, Die Natürlichen Pflanzenfamilien, vol. 3, pt. 3, p. 112, fig. 68.)

Astrocaryum sp. (Phoenicaceae), 47997. **Palm.** From Bogotá, Colombia. Seeds presented by Mr. M. T. Dawe. "In my recent journeys I came across a palm known as 'Güere.' It is found in the forests of the Darien country, and grows from sea level to altitudes of about 400 meters [1,300 feet]. The palm is about 10 meters [33 feet] in height and bears large, hanging racemes of scarlet-colored fruits, the nuts of which yield a useful oil." (Dawe.)

Berberis pruinosa (Berberidaceae), 48015. **Barberry.** From Paris, France. Seeds presented by Vilmorin-Andrieux & Co. A robust evergreen shrub, probably 10 feet or more in height, native to southwestern China. Its leaves are of a leathery texture, up to 2½ inches long, lustrous green above, often grayish beneath, not unlike in general appearance those of the Himalayan *B. aristata.* It gets its name from the rich pruinose (plum-colored) bloom that covers the fruits. (Adapted from The Gardeners' Chronicle, Nov. 15, 1913.)

Beta vulgaris (Chenopodiaceae), 48022. **Sugar beet.** From Naarden, Holland. Seeds presented by Kuhn & Co.,

through Mr. Joseph W. Pincus. Introduced for variety tests being carried on by Department specialists.

The following table shows results of experimental tests with this variety:

	per cent of sugar.	beets per acre.	sugar (lbs.) per acre.
In Bohemia	19.37	35543	6885
In Zeeland, Holland	16.93	39677	6717

Elaeis guineensis (Phoenicaceae), 48001 to 48010. Oil palm. From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, chief, Plant Breeding Station. "I am mailing seeds of *E. guineensis*, which were collected from trees grown in our garden at Sumatra." (Cramer.)

This palm is very important economically. The fruit is used by the natives for food; the leafstalks and leaves for thatching houses; and the fleshy outer layer and kernels of the fruit each yield a commercial oil,- that from the fleshy part being the ordinary palm-oil used in the manufacture of soap and candles, and that from the kernels being the white or nut-oil used for making margarine or artificial butter. (Adapted from MacMillan, Handbook of Tropical Gardening and Planting, p. 538.)

See Plate No. 241, Plant Immigrants, No. 159, July, 1919.

Juglans cathayensis (Juglandaceae), 48014. From Rochester, N. Y. Seeds presented by Mr. John Dunbar, assistant superintendent of parks. "This Juglans is said to grow 70 feet tall, but it does not show any tendency to be arborescent here. Our plants, which were received from the Arnold Arboretum in 1911, are about 10 years old, 8 feet tall, and bushy in habit. They began bearing two years since. The nuts germinate readily." (Dunbar.)

Mimusops kauki (Sapotaceae), 48011. From Buitenzorg, Java. Seeds presented by Dr. P. J. S. Cramer, chief, Plant Breeding Station. Seeds from big fruits. The taste resembles very much that of *Achras sapota*, but the fruit is not eaten very often by Europeans. It is a tree that likes to grow near the sea." (Cramer.)

Myrica rubra (Myricaceae), 48000. From Del Monte, Calif. Seeds presented by Mr. T. Lee, Hotel Del Monte. "The beautiful, dark purple fruits are the size of crab apples and can be eaten out of hand or made into compotes, pies, syrup, and wine. There is great variation in the habit and productivity of the trees and also in the color, size, and taste of the fruits. The trees are evergreen, and thrive best in well-drained rocky terraces. The localities that will best suit them in the United States will probably be the southern sections of the Gulf coast states and the milder parts of California. Chinese name 'Yang mae.'" (F. N. Meyer.)

For previous introduction and description, see S. P. I. No. 46571, Plant Immigrants, No. 150, October, 1918, p. 1364.

Phaseolus coccineus (Fabaceae), 48021. **Scarlet runner bean.** From Landing, N. J. Seeds presented by Mr. Hudson Maxim. "Chile beans which I secured from a member of the Du Pont Company, who traveled in Argentina and Chile. These beans grow in a wet district at a high altitude in the Andes, and are very frost resistant. From early August until the ground freezes in the fall one may have the very best of string beans from this variety, and the large, juicy pods, which are borne most prolifically, may be eaten even after they have been pretty well filled out with seeds. By the latter part of August, the beans are large enough to be used as limas, and they are superior to any that I know. The plants want very rich soil and an abundance of water, and climbing space; they reach a height of 20 feet or more. The dry beans are hard, plump, and glossy." (Maxim.)

Prioria copaifera (Caesalpiniaceae), 47998. From Bogota, Colombia. Seeds presented by Mr. M. T. Dawe. "Seeds of the 'Cativo' tree. This tree is abundant in the Gulf of Uraba, and yields a resin known locally as 'Cativa,' which is used for caulking boats. I understand that the tree is also found in the Canal Zone, so that it, or its product, is probably well known. I may mention that the tree is very abundant in the lowlands of this country and that the resin could be obtained in very large quantities should it possess any commercial value." (Dawe.)

Rheum sp. (Polygonaceae), 48020. **Rhubarb.** From Durban, Natal, South Africa. Roots purchased from

R. Mason & Son, through Mr. William W. Masterson, American consul. "A kind of garden rhubarb that is grown here, which will be a valuable introduction if similar results can be obtained with it in America. This rhubarb comes on in the early spring (October), – a tender and crisp plant that is used extensively for the table as it is with us; but, unlike our rhubarb, which soon becomes fibrous and tough, this rhubarb lasts about seven months and is as good during that time as when it first came on the market in the spring. I do not know whether this difference is caused by the climate, soil, or other local reasons, or whether it is another kind of rhubarb. I only know it is delicious, is invariably good and tender, and lasts over half the year." (Masterson.)

Saccharum officinarum (Poaceae), 47995. **Sugar cane.** From St. Croix, Virgin Islands. Cuttings presented by Dr. Longfield Smith, Agricultural Experiment Station. "'S. C.– 12/4.' We are getting splendid results here with our cane 'S. C. – 12/4.' We now have over 100 acres planted in this island. Plantations which have trial areas report from 25 per cent up to 90 per cent more sugar per acre than from standard cane." (Smith.)

For previous introduction and description, see S. P. I. No. 45513, Plant Immigrants, No. 141, January, 1918, p. 1270.

Notes on Behavior of Previous Introductions.

The following is an extract from a report, dated November 5, 1918, from Mrs. L. B. Grando, Montgomery, Ala.:

You sent me four seed chayotes (*Chayota edulis*) last spring and I planted them. Only two of the vines matured; on one there are some ninety-odd nearly mature chayotes, and the other has only ten ripe ones on it. My vines are bearing fruits almost twice as large as those sent from Florida and are now covered with blossoms and young fruits. These vines had very little attention this summer, except that I mulched them rather heavily before I left home for a month. They are the wonder of every one who has seen them; and the fruits are in great demand for seed. [See Plates 249 and 250.]

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, Wilson Popenoe, and H. L. Shantz, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, E. L. Crandall, L. G. Hoover, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Seharunpur, India; Mr. E. W. D. Holway, Faribault, Minn.; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla ; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum. Jamaica Plain, Mass.; Dr. F. A. Woods, Boston, Mass.

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF FOREIGN SEED AND PLANT INTRODUCTION
WASHINGTON, D. C.

Washington Scientific Staff.

David Fairchild, Agricultural Explorer in Charge.
P. H. Dorsett, Plant Introducer, in Charge of Field Stations.
B. T. Galloway, Plant Pathologist, in Charge of Detention Laboratories.
Peter Bisset, Plant Introducer, in Charge of Distributions.
J. B. Norton, Wilson Popenoe, and H. L. Shantz, Agricultural Explorers.
R. A. Young, Plant Introducer, in Charge of Dasheen Investigations.
H. C. Skeels, Botanist, in Charge of Collections.
G. P. VanEseltine, Asst. Botanist, in Charge of Publications.
H. E. Allanson, E. L. Crandall, L. G. Hoover, R. N. Jones, P. G. Russell, and C. C. Thomas, Assistants.
Edward Goucher, Plant Propagator.

Field Stations Scientific Staff.

R. L. Beagles, Superintendent in Charge, Field Station, Chico, Cal.
E. O. Orpet, Assistant.
J. E. Morrow, Superintendent in Charge, (Yarrow) Field Station, Rockville, Md.
Edward Simmonds, Superintendent in Charge, Field Station, Miami, Fla.
Henry E. Juenemann, Superintendent in Charge, Field Station, Bellingham, Wash.
D. A. Bisset, Assistant in Charge, Field Station, Brooksville, Fla.
E. J. Rankin, Assistant in Charge, Field Station, Savannah, Ga.

Special Collaborators.

Mr. Thomas W. Brown, Cairo, Egypt; Mr. H. M. Curran, Bahia, Brazil; Mr. M. J. Dorsey, University Farm, St. Paul, Minn.; Mr. Robt. H. Forbes, Cairo, Egypt; Mr. A. C. Hartless, Seharunpur, India; Mr. E. W. D. Holway, Faribault, Minn.; Mr. Barbour Lathrop, Chicago, Ill.; Mr. H. L. Lyon, Honolulu, Hawaii; Mr. H. Nehrling, Gotha, Fla ; Mr. Charles Simpson, Littleriver, Fla.; Dr. L. Trabut, Director, Service Botanique, Algiers, Algeria; Mr. H. N. Whitford, School of Forestry, New Haven, Conn.; Mr. E. H. Wilson, Arnold Arboretum. Jamaica Plain, Mass.; Dr. F. A. Woods, Boston, Mass.

Silviculture.

409292

SD391
P3
v.13

UNIVERSITY OF CALIFORNIA LIBRARY